

HITSP Retrieve Medical Knowledge Capability

HITSP/CAP122



Healthcare Information Technology Standards Panel

Submitted to:

Healthcare Information Technology Standards Panel

Submitted by:

Capabilities Team



DOCUMENT CHANGE HISTORY

Version Number	Description of Change	Name of Author	Date Published
0.0.1	Review Copy	Capabilities Team	November 9, 2009
0.0.2	Review Copy	Selected Perspective, Domain and/or Tiger Team Reviewers	January 18, 2010
1.0	Released for Implementation	Selected Perspective, Domain and/or Tiger Team Reviewers	January 25, 2010



TABLE OF CONTENTS

1.0	INTRODUCTION	5
1.1	Capability Overview	6
1.2	Scope.....	6
1.3	Copyright Permissions.....	6
1.4	Reference Documents.....	6
1.5	Guidance For Use of a Capability.....	7
2.0	REQUIREMENTS ANALYSIS	8
2.1	Introduction	8
2.2	Requirements	8
2.2.1	Information Exchanges	8
3.0	EXTERNAL CAPABILITY OPTIONS	10
3.1	Security and Privacy	10
4.0	DESIGN SPECIFICATION	11
4.1	Requirements Mapped to Constructs	11
4.1.1	Constructs.....	11
4.2	Constraints and Assumptions.....	11
4.3	Specified Interfaces by System Role.....	12
5.0	STANDARDS	14
5.1	Standards Used.....	14
5.1.1	Regulatory Guidance.....	14
5.1.2	Selected Standards	14
5.1.3	Informative Reference Standards.....	15
5.2	Standards Gaps and Overlaps	15
6.0	APPENDIX	16
7.0	DOCUMENT UPDATES	17
7.1	November 9, 2009	17
7.2	January 18, 2010.....	17
7.3	January 25, 2010.....	17



FIGURES AND TABLES

Figure 2-1 Information Exchanges Between System Roles	9
Table 1-1 Reader's Guide for Capability	5
Table 1-2 Reference Documents	6
Table 2-1 Reader's Guide for Section 2.0	8
Table 2-2 Capability System Roles	8
Table 2-3 Supported Information Exchanges	8
Table 3-1 Reader's Guide for Section 3.0	10
Table 4-1 Reader's Guide for Section 4.0	11
Table 4-2 Information Exchanges Mapped to Constructs	11
Table 4-3 Context	12
Table 4-4 Knowledge Requester System Role Mapped to HITSP Construct Interfaces	12
Table 4-5 Knowledge Resource System Role Mapped to HITSP Construct Interfaces	12
Table 4-6 Value Set System Role Mapped to HITSP Construct Interfaces	12
Table 4-7 Value Set Repository System Role Mapped to HITSP Construct Interfaces	12
Table 4-8 Implementation Conditions	13
Table 5-1 Reader's Guide for Section 5.0	14
Table 5-2 Regulatory Guidance	14
Table 5-3 Selected Standards	14
Table 5-4 Informative Reference Standards	15
Table 5-5 Information Exchange Requirements (IER) and Associated Standards Gaps	15
Table 5-6 Information Exchange Requirements (IER) and Associated Standards Overlaps	15



1.0 INTRODUCTION

This Healthcare Information Technology Standards Panel (HITSP) document is divided into Requirements Analysis, External Capability Options, Design Specifications and Standards sections which may be used by analysts, architects and implementers. Analysts refer to this document to determine if the Capability satisfies their requirements. Architects and system implementers refer to this document as the architectural specifications for a system design, while software developers will use a Capability as the source of the design for interoperable information exchange. The Appendix lists requirements satisfied by this Capability.

All sections may be useful to analysts and architects. However as shown in Table 1-1, different readers may find specific sections of greater interest and utility. This table is provided as an aid to readers to assist them in identifying sections to focus on. Readers are encouraged to review all sections of this document to further their understanding of HITSP's work.

Table 1-1 Reader's Guide for Capability

Document Section	Section Number	Intended Audience	Information Contained
Section 2.0 Requirements Analysis	2.1 Introduction	Policy Managers Policy Analysts Executive Leadership	Provides an overview of the requirements which this Capability addresses, and identifies the system roles supported by the Capability
	2.2 Requirements	Program Managers Policy Analysts Executive Leadership Architects Business Analysts	Defines the actual information exchanges supported by the Capability in terms of exchange actions and exchange content. It shows how these roles can be assigned at a higher level to real world systems, such as an Electronic Health Record
Section 3.0 External Capability Options	3.1 Security and Privacy	Policy Analysts Architects Business Analysts Developers	Describes the integrated and optional security and privacy functions supported by the Capability
Section 4.0 Design Specification	4.1 Requirements Mapped to Constructs	Program Managers Architects Business Analysts Developers	Maps the information exchanges developed in requirements to the actual HITSP construct used by the Capability to support the exchange
	4.2 Constraints and Assumptions	Business Analysts Developers	Lists the context that is necessary to use the Capability, including constraints, assumptions, pre-conditions, post-conditions and triggers
	4.3 Specified Interfaces by System Role	Business Analysts Developers	Identifies the constructs and their interfaces assigned to each system role. It also lists the implementation conditions for use
Section 5.0 Standards	5.1 Standards Used	Program Managers Policy Analysts Architects Business Analysts Developers	Lists regulatory guidance, selected standards and informative references used by the Capability and all its supporting constructs
	5.2 Standards Gaps and Overlaps	Program Managers Policy Analysts Architects Business Analysts Developers	Identifies gaps or overlaps in standards to implement the Capability including a plan to resolve issues



1.1 CAPABILITY OVERVIEW

This Capability addresses the requirements to retrieve medical knowledge that is not patient-specific based on context parameters. The actual content delivered is not constrained by this Capability; this Capability focuses on providing the mechanism to ask for (query) and receive the medical knowledge.

1.2 SCOPE

A Capability enables business and policy requirements for a business need to be implemented through information exchanges specified in HITSP constructs. The objective of a Capability is to provide the bridge between the business, policy and implementation disciplines by defining a set of information exchanges at a level relevant to policy and business decisions and specifying the use of HITSP constructs sufficiently for implementation. A Capability supports stakeholder requirements and business processes and includes information content, infrastructure, security and privacy. The design of Capabilities leverages existing HITSP constructs and communication methodologies. As new constructs become available, the scope of this Capability may be extended.

1.3 COPYRIGHT PERMISSIONS

COPYRIGHT NOTICE

© 2010 ANSI. This material may be copied without permission from ANSI only if and to the extent that the text is not altered in any fashion and ANSI's copyright is clearly noted.

1.4 REFERENCE DOCUMENTS

A list of key reference documents and background material is provided in the table below. These documents can be retrieved from [HITSP Web Site](#).

Certain materials contained in this Interoperability Specification are reproduced from Health Level Seven (HL7) Common Terminology Services (CTS) Release 1 with permission of Health Level Seven, Inc. No part of the material may be copied or reproduced in any form outside of the Interoperability Specification documents, including an electronic retrieval system, or made available on the Internet without the prior written permission of Health Level Seven, Inc. Copies of standards included in this Interoperability Specification may be purchased from the Health Level Seven, Inc. Material drawn from these standards is credited where used.

Certain materials contained in this Interoperability Specification are reproduced from Health Level Seven (HL7) Version 3.0 Context-Aware Information Retrieval Specification: URL Implementation Guide with permission of Health Level Seven, Inc. No part of the material may be copied or reproduced in any form outside of the Interoperability Specification documents, including an electronic retrieval system, or made available on the Internet without the prior written permission of Health Level Seven, Inc. Copies of standards included in this Interoperability Specification may be purchased from the Health Level Seven, Inc. Material drawn from these standards is credited where used.

IHE materials used in this document have been extracted from relevant copyrighted materials with permission of Integrating the Healthcare Enterprise (IHE) International. Copies of this standard may be retrieved from the IHE Web Site at www.ihe.net.

Table 1-2 Reference Documents

Reference Documents	Document Description
HITSP Acronyms List	Lists and defines the acronyms used in this document
HITSP Glossary	Provides definitions for relevant terms used by HITSP documents
TN900 – Security and Privacy	TN900 is a reference document that provides the overall context for use of the HITSP Security and Privacy constructs
TN901 - Clinical Documents	TN901 is a reference document that provides the overall context for use of the HITSP Care Management and Health Records constructs



Reference Documents	Document Description
TN903 – Data Architecture	TN903 is a reference document that provides the overall context for use of the HITSP Data Architecture constructs
TN904 – Harmonization Framework and Exchange Architecture	TN904 is a reference document that provides the overall context for use of the HITSP Harmonization Framework and Exchange Architecture constructs

1.5 GUIDANCE FOR USE OF A CAPABILITY

NOTE: For questions related to details on HITSP Capabilities and HITSP System Roles, please refer to HITSP/TN904 Harmonization Framework and Exchange Architecture Technical Note.

To use a HITSP Capability, a HITSP Interoperability Specification or an implementation conformance statement must assign specific systems to one or more HITSP Capability System Roles and identify how the HITSP Capability Options are to be addressed. In order to assign systems to HITSP System Roles, the reader uses Table 2-3 Supported Information Exchanges to determine what systems can support the specific information exchanges required. For an example of how HITSP System Roles and systems are mapped, readers can consult a HITSP Interoperability Specification Table 3-3 Orchestration of Capabilities by System. In the case of an Implementation Guide, systems can be assigned to HITSP System Roles using a similar methodology.

The use of a HITSP Capability implies that these specific rules will be followed:

- For each HITSP Capability System Role listed in Table 2-2 Capability System Roles, the defined responsibilities of that HITSP Capability System Role are supported. Responsibilities for the HITSP Capability System Role are defined as support for the HITSP Construct interfaces listed in Section 4.3 Specified Interfaces by System Role. Support implies that the system assigned to the HITSP Capability System Role makes the associated HITSP construct interfaces available for use by other systems. For those HITSP construct interfaces in Section 4.3 that have associated content optionality, the HITSP Capability System Role must comply with the optionality condition listed in Table 4-8 Implementation Conditions.
- Responsibilities also include the constraints and assumptions associated with use of a Capability, as outlined in Table 4-3 Context. For those Capabilities with Section 3.2 options, the following additional rules apply:
 1. Each topology option listed in Table 3-2 Topology Related Options should be supported by the implementation
 2. Each content import option listed in Table 3-3 Content Import Options should be supported by the implementation
 3. Each document content option listed in Table 3-4 Document Content Options should be supported by the implementation



2.0 REQUIREMENTS ANALYSIS

The following table is provided as an aid to readers to assist them in identifying the parts of this section to focus on. Readers are encouraged to review all sections of this document to further their understanding of HITSP's work.

Table 2-1 Reader's Guide for Section 2.0

Document Section	Section Number	Intended Audience	Information Contained
Section 2.0 Requirements Analysis	2.1 Introduction	Policy Managers Policy Analysts Executive Leadership	Provides an overview of the requirements which this Capability addresses, and identifies the system roles supported by the Capability
	2.2 Requirements	Program Managers Policy Analysts Executive Leadership Architects Business Analysts	Defines the actual information exchanges supported by the Capability in terms of exchange actions and exchange content. It shows how these roles can be assigned at a higher level to real world systems, such as an Electronic Health Record

2.1 INTRODUCTION

Table 2-2 summarizes the system roles of the Capability. Section 2.2 identifies how these system roles participate in the set of information exchanges.

Table 2-2 Capability System Roles

System Role	System Role Definition
Knowledge Requester	The system that is the source of the request for medical knowledge from the Knowledge Resource
Knowledge Resource	The system that responds to the request for medical knowledge
Value Set Consumer	The system that requests the value set from the Value Set Repository
Value Set Repository	The system that responds to the request for value sets with value sets managed in its repository

2.2 REQUIREMENTS

2.2.1 INFORMATION EXCHANGES

Table 2-3 defines each of the Information Exchanges supported by this Capability in terms of the Exchange Action (EA) or Exchange Content (EC) used.

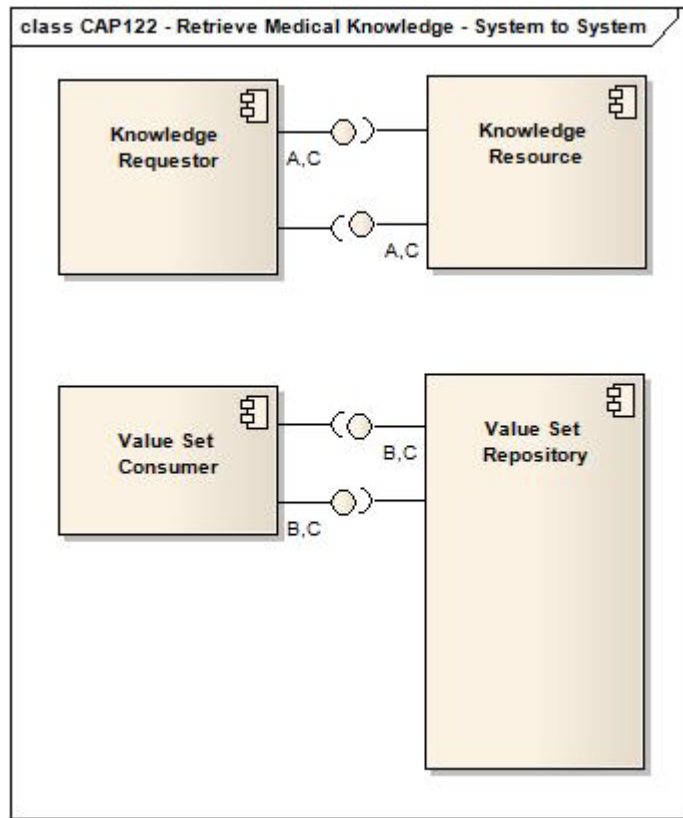
Table 2-3 Supported Information Exchanges

Information Exchange Identifier	Exchange Action	Exchange Content
A	Request & Response	HITSP/T81 – Retrieval of Medical Knowledge
B	Request & Response	HITSP/T66 – Retrieve Value Set
C	Request & Response	HITSP/SC111 – Knowledge and Vocabulary

Figure 2-1 identifies how this Capability supports various system roles within multiple system architectures. For example, either an Electronic Health Record (EHR) system or a Health Information Exchange (HIE) might fill a document repository system role in an information exchange). In an implementation architecture, system roles may be combined locally (e.g., Hospital EHR System) and in others, the system roles may be provided by multiple-distributed trusted third parties (e.g., pharmacies within an HIE).



Figure 2-1 Information Exchanges Between System Roles



3.0 EXTERNAL CAPABILITY OPTIONS

The following table is provided as an aid to readers to assist them in identifying the parts of this section to focus on. Readers are encouraged to review all sections of this document to further their understanding of HITSP's work.

Table 3-1 Reader's Guide for Section 3.0

Document Section	Section Number	Intended Audience	Information Contained
Section 3.0 External Capability Options	3.1 Security and Privacy	Policy Analysts Architects Business Analysts Developers	Describes the integrated and optional Security and Privacy functions supported by the Capability

This section is primarily for architects, engineers and analysts. It allows those who consider using this Capability to evaluate and/or constrain the options that are externally made available for the Capability implementers.

Interoperability among system roles defined by this Capability often requires the selection of consistent options.

3.1 SECURITY AND PRIVACY

The application of Security and Privacy is highly influenced by the security and privacy policies. The HITSP Security and Privacy Technical Note (HITSP/TN900) provides a detailed discussion of the Security and Privacy constructs, including consideration and appropriate context for needed security and privacy related policy decisions. Security and privacy constructs are integrated comprehensively into the Service Collaborations. The actual constructs used and the way in which the constructs are used is dependent on the policies and physical setting. Conformance claims are against the Security and Privacy constructs that are chosen to enforce the policies.



4.0 DESIGN SPECIFICATION

The following table is provided as an aid to readers to assist them in identifying the parts of this section to focus on. Readers are encouraged to review all sections of this document to further their understanding of HITSP's work.

Table 4-1 Reader's Guide for Section 4.0

Document Section	Section Number	Intended Audience	Information Contained
Section 4.0 Design Specification	4.1 Requirements Mapped to Constructs	Program Managers Architects Business Analysts Developers	Maps the information exchanges developed in requirements to the actual HITSP construct used by the Capability to support the exchange
	4.2 Constraints and Assumptions	Business Analysts Developers	Lists the context that is necessary to use the Capability, including constraints, assumptions, pre-conditions, post-conditions and triggers
	4.3 Specified Interfaces by System Role	Business Analysts Developers	Identifies the constructs and their interfaces assigned to each system role. It also lists the implementation conditions for use

4.1 REQUIREMENTS MAPPED TO CONSTRUCTS

4.1.1 CONSTRUCTS

Table 4-2 defines the mapping of the Information Exchanges supported by this Capability in terms of the Exchange Action (EA), Exchange Content (EC) and any Constraints applied to the Information Exchange with specific initiating and/or responding system interfaces. This provides the traceability of constructs to the information exchanges identified in Section 2.0 above. Content modules and terminology components are not listed here because they are referenced by other constructs, but do not provide an interface. HITSP/TN903 discusses how content modules and terminology components are referenced by other constructs.

Table 4-2 Information Exchanges Mapped to Constructs

Information Exchange Identifier	Exchange Type	Construct Identifier	Description
A	Action and Content	HITSP/T81 – Retrieval Medical Knowledge	The HITSP Medical Knowledge Transaction requests and receives additional knowledge about a medical concept based on specific context parameters
B	Action and Content	HITSP/T66 - Retrieve Value Set	The HITSP Retrieve Value Set Transaction is used to transform human or computer vocabularies. For example, it can be used to convert the initial capture of a human-readable concept into a computer vocabulary captured in a document or message that will be communicated. It may also be used in the reverse, to take computer vocabulary and convert to human-readable form
A and B	Action and Content	HITSP/SC111 - Knowledge and Vocabulary	The HITSP Knowledge and Vocabulary Service Collaboration provides the ability to retrieve medical knowledge and terminology

4.2 CONSTRAINTS AND ASSUMPTIONS

Table 4-3 specifies the context that must be provided in order to use the Capability, identifying any assumptions, pre-conditions, post-conditions, and triggers relevant for use of the Capability.



Table 4-3 Context

Assumptions, Pre-conditions, Post-conditions, and Triggers	Type of Context
The context-specific parameters regarding the request for medical knowledge may include consumer knowledge level, preferred language, consumer demographics (gender, age), document type (laboratory results, radiology reports). If these parameters are known, these could be used to tailor the response and the medical knowledge returned	Assumption
A user-friendly error message is displayed in the event of query failure	Post-condition
Automatic request: Based upon predefined parameters, the requesting system may initiate, a request for medical knowledge from the Knowledge Resource	Process Trigger
Manual request: The user may initiate a request for medical knowledge from the Knowledge Resource	Process Trigger

4.3 SPECIFIED INTERFACES BY SYSTEM ROLE

This section specifies the HITSP Capability interfaces in terms of the System Roles identified in Table 2-2 Capability's System Roles.

Table 4-4 below specifies interfaces for the first system role as defined in Table 2-2.

Table 4-4 Knowledge Requester System Role Mapped to HITSP Construct Interfaces

Construct Interface	Interface Type	T/TP/SC or Content	T/SC/Content Optionality
Knowledge Requester	Initiating	Knowledge and Vocabulary (HITSP/SC111)	R
Knowledge Requester	Initiating	Retrieval of Medical Knowledge (HITSP/T81)T81	R

Optionality Legend: "R" for Required, "O" for Optional, or "C" for Conditional

Table 4-5 specifies interfaces for responding system roles as defined in Table 2-2.

Table 4-5 Knowledge Resource System Role Mapped to HITSP Construct Interfaces

Construct Interface	Interface Type	T/TP/SC or Content	T/SC/Content Optionality
Knowledge Resource	Responding	Knowledge and Vocabulary (HITSP/SC111)	R
Knowledge Resource	Responding	Retrieval of Medical Knowledge (HITSP/T81)	R

Optionality Legend: "R" for Required, "O" for Optional, or "C" for Conditional

Table 4-6 specifies interfaces for responding system roles as defined in Table 2-2.

Table 4-6 Value Set System Role Mapped to HITSP Construct Interfaces

Construct Interface	Interface Type	T/TP/SC or Content	T/SC/Content Optionality
Value Set Consumer	Initiating	Knowledge and Vocabulary (HITSP/SC111)	R
Value Set Consumer	Initiating	Retrieve Value Set (HITSP/T66)	R

Optionality Legend: "R" for Required, "O" for Optional, or "C" for Conditional

Table 4-7 specifies interfaces for responding system roles as defined in Table 2-2.

Table 4-7 Value Set Repository System Role Mapped to HITSP Construct Interfaces

Construct Interface	Interface Type	T/TP/SC or Content	T/SC/Content Optionality
Value Set Repository	Responding	Knowledge and Vocabulary (HITSP/SC111)	C122 [101]
Value Set Consumer	Responding	Retrieve Value Set (HITSP/T66)	R

Optionality Legend: "R" for Required, "O" for Optional, or "C" for Conditional

Table 4-8 specifies optionality conditions referenced in Table 4-4 through 4-7 above.



Table 4-8 Implementation Conditions

Condition ID	Condition Description
C122 [101]	At least one Value Set Repository source must respond



5.0 STANDARDS

The following table is provided as an aid to readers to assist them in identifying the parts of this section to focus on. Readers are encouraged to review all sections of this document to further their understanding of HITSP's work.

Table 5-1 Reader's Guide for Section 5.0

Document Section	Section Number	Intended Audience	Information Contained
Section 5.0 Standards	5.1 Standards Used	Program Managers Policy Analysts Architects Business Analysts Developers	List regulatory guidance, selected standards and informative references used by the Capability and all its supporting constructs
	5.2 Standards Gaps and Overlaps	Program Managers Policy Analysts Architects Business Analysts Developers	Identifies gaps or overlaps in standards to implement the Capability including a plan to resolve issues

5.1 STANDARDS USED

5.1.1 REGULATORY GUIDANCE

Table 5-2 lists any regulatory guidance that determines or constrains use of standards.

Table 5-2 Regulatory Guidance

Regulation	Description
None	

5.1.2 SELECTED STANDARDS

Table 5-3 lists the standards selected as relevant to this Capability.

Table 5-3 Selected Standards

Standard	Description
Health Level Seven (HL7) Common Terminology Services (CTS) Release 1	The HL7 Common Terminology Services (HL7 CTS) defines an Application Programming Interface (API) that can be used when accessing terminological content. The CTS specification was developed as an alternative to a common data structure. Instead of specifying what an external terminology must look like, HL7 has chosen to identify the common functional characteristics that an external terminology must be able to provide. As an example, an HL7 compliant terminology service will need to be able to determine whether a given concept code is valid within the particular resource. Instead of describing a table keyed by the resource identifier and concept code, the CTS specification describes an Application Programming Interface (API) call that takes a resource identifier and concept code as input and returns a true/false value. Each terminology developer is free to implement this API call in whatever way is most appropriate for them. It describes a set of API calls that represent the core functionality that will be needed by basic HL7 Version 3 applications. For more information visit www.hl7.org
Integrating the Healthcare Enterprise (IHE) IT Infrastructure Technical Framework (ITI-TF) Supplement 2008-2009 Sharing Value Sets (SVS) Integration Profile	The Sharing Value Sets (SVS) Integration 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. For more information visit http://www.ihe.net/



Standard	Description
Health Level Seven (HL7) Version 3.0 Context-Aware Information Retrieval Specification: URL Implementation Guide	Informative implementation guide for URL-based implementations of the context-aware information retrieval ("Infobutton") The goal of this infobutton implementation guide is to recommend a URL-based implementation of the context-aware information retrieval ("infobutton") domain. The intent is to provide a simple way to implement infobuttons that is compatible with the current state of the market in this area. Most infobutton implementations to date, especially on the side of on-line information resources, rely on URL-based APIs. For more information visit http://www.hl7.org

5.1.3 INFORMATIVE REFERENCE STANDARDS

Table 5-4 includes reference standards that inform the overall semantic interoperability.

Table 5-4 Informative Reference Standards

Standard	Description
No applicable informative reference standards	

5.2 STANDARDS GAPS AND OVERLAPS

Table 5-5 identifies the information exchange requirements and known standards gaps, along with the recommended resolutions to the gaps.

Table 5-5 Information Exchange Requirements (IER) and Associated Standards Gaps

IER Gap Description	Responsible HITSP TC	Design Approach	Required Standards Now Unavailable for Constructs	SDO Working on Unavailable Standards	Expected Availability
None					

Table 5-6 lists any standards overlaps and describes plans to resolve each of the overlaps.

Table 5-6 Information Exchange Requirements (IER) and Associated Standards Overlaps

IER Number	Summary Description	Standard Overlap	Recommended Resolution
None			



6.0 APPENDIX

This section may include additional materials referenced throughout this document, such as requirements analysis tables and figures. If the Capability is yet to be implemented, it may contain the candidate standards for Tier 2 evaluations.

HITSP Interoperability Specifications that were used to derive this Capability:

- HITSP/IS03 – Consumer Empowerment and Access to Clinical information via Network
- HITSP/IS05 – Consumer Empowerment and Access to Clinical Information via Media
- HITSP/IS08 – Personalized Healthcare
- HITSP/IS10 – Immunizations and Response Management
- HITSP/IS11 – Public Health Case Reporting
- HITSP/IS92 – Newborn Screening



7.0 DOCUMENT UPDATES

The following sections provide the details of updates made to this document.

7.1 NOVEMBER 9, 2009

No changes. This is the first published version of the document.

7.2 JANUARY 18, 2010

Updated to HITSP Capability Template Version 2.3

7.3 JANUARY 25, 2010

Upon approval by the HITSP Panel on January 25, 2010, this document is now Released for Implementation.

