

Advancing HL7 v2 to New Heights:

A Platform for Developing Specifications, Test Plans, and Testing Tools

IHIC

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HL7 v2 is Alive and Well!

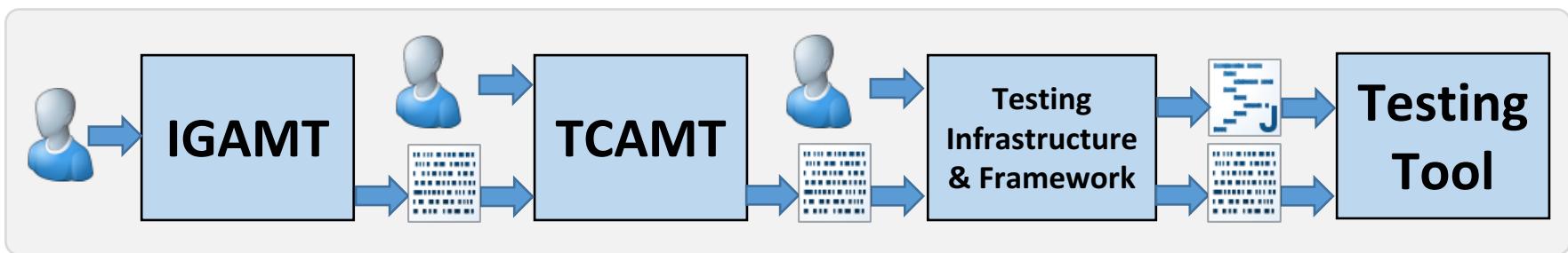
End-to-End Strategy

- Specification of Requirements
 - Development of Specifications
 - Development of Test Cases
 - Testing Infrastructure
 - Platform to build and manage tools
-
- NIST builds the platform—let domain experts create and maintain guides, test cases, and tool instances via productivity tools

Why a Better Approach is Needed

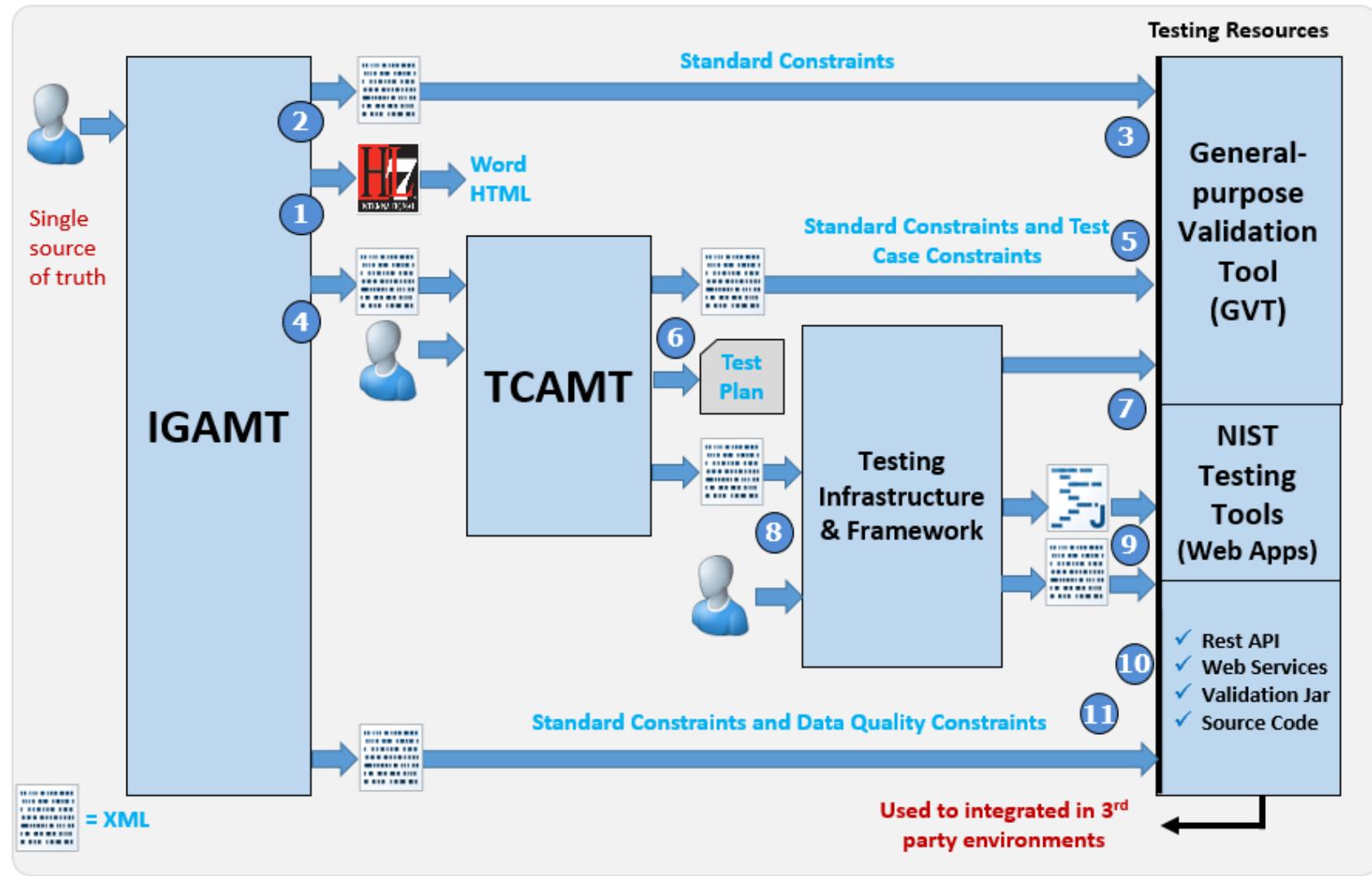
- ❑ Ambiguous and inconsistent HL7 v2 IGs
- ❑ Inadequate conformance mechanisms to specify requirements
- ❑ Misuse and misunderstanding of conformance concepts
- ❑ Limited/outdated tools to help in standards development
- ❑ Lack of tools to create test cases and example messages
- ❑ Example messages in IGs are always wrong
- ❑ Conformance Testing bound to the quality of the IG
- ❑ Conformance Testing tools are often not rigorous/complete
- ❑ Conformance Testing Tools are expensive to build
- ❑ Conformance Testing Tools are expensive to maintain
- ❑ Lack of tools to assist in creating conformance tools
- ❑ Testing Platform to meet the stages of testing
- ❑ Lack of tooling to migrate from national IGs to local implementations easily
- ❑ Lack of complete standards development life-cycle (tooling)

NIST HL7 v2 Platform Overview



- IGAMT – Implementation Guide Authoring and Management Tool → **Specification**
- TCAMT – Test Case Authoring and Management Tool → **Test Plans**
- Testing Infrastructure and Framework
- Testing Tool → **Conformance Testing**

NIST Integrated Platform



IGAMT Demo: Overview, Narrative, Structure, Profiling

NIST IGAMT Implementation Guide Authoring and Management Tool **2.0.0-beta6**

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IZ Profiles	09/06/2016 00:00	Rob Snelick, NIST	
IHE IG	09/13/2016 00:00	Rob Snelick	
HL7 Version 2.8.2 Implementation Guide: Immunization Messaging	02/03/2017 13:28	Rob Snelick	
Syndromic Test	02/16/2017 15:16	Rob Snelick	
ORU Example	06/08/2017 13:24	Rob Snelick	
DEMO	10/03/2017 14:41	Rob Snelick, NIST	
HL7 Version 2.8.2 Implementation Guide: Immunization Messaging with enhanced query	09/05/2017 13:43	Rob Snelick	
TEST-HL7 Version 2.8.2 Implementation Guide: Immunization Messaging with enhanced query	08/14/2017 14:22	Rob Snelick	
HL7 Version 2.6 Implementation Guide: Vital Records Birth & Fetal Death Reporting Release 1 - US Realm- Copy	07/24/2017 14:41	Rob Snelick, Public Health and Emergency Response Work Group	
TestMMG- Copy	10/03/2017 12:12	Rob Snelick, CDC	
EIP v1- Copy	08/31/2017 08:19	Rob Snelick, CDC	
HL7 Version 2.8.2 IG: Immunization Messaging- submitted for ballot 20170323-DEMO-SAVE	10/02/2017 17:21	Rob Snelick	

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HL7 Version 2.8.2 Implementation Guide: Immunization Messaging with enhanced query

FILTER OFF

- 2.7.5.7.Returning Message Processing Error
- Acknowledgement
- 2.7.5.8.Returning Message Rejection
- Acknowledgements
- 2.7.6.Messaging Capabilities
 - 2.7.6.1.Evaluation
 - 2.7.6.1.1.Vaccine Group
 - 2.7.6.1.2.Schedule
 - 2.7.6.1.3.Series Name
 - 2.7.6.1.4.Dose Validity
 - 2.7.6.1.5.Number of Doses in the Series
 - 2.7.6.1.6.Ordinal Position
 - 2.7.6.1.7.Reason
 - 2.7.6.2.Forecast
 - 2.7.6.2.1.Dates
 - 2.7.6.2.2.Series Status
 - 2.7.7.Sample Messages
 - 2.7.7.1.Single High Threshold Match
 - 2.7.7.2.Evaluation of a Combination Vaccine
 - 2.7.7.3.Special Indication for Forecasted Dose
 - 2.7.7.4.Protected Patient
 - 2.7.7.5.No Matching Patients
 - 2.7.7.6.Multiple Matching Patients
 - 2.7.7.7.More Than the Maximum Number of Patients Found
 - 2.7.7.8.Message Processing Error
 - Acknowledgement
 - 2.7.7.9.Message Rejection Acknowledgement
- 3.Message Infrastructure
 - 3.1.Profile Components
 - 3.2.Conformance Profiles
 - [1] VXU^V04|VXU_V04-Z22-Send an Unsolicited Immunization Event
 - [2] ACK^Varies*ACK-Z23-Respond with a General Acknowledgement
 - [3] ADT^A31^ADT_A05-Z24-Send Demographics Only Content
 - [4] QBP^Q11^QBP_Q11-Z34-Request a Complete Immunization History
 - [5] QBP^Q11^QBP_Q11-Z44-Request an Evaluated Immunization History and Forecast
 - [6] QBP^Q11^QBP_Q11-Z54-Request a Complete Immunization History With Evaluation and Forecast
 - [7] RSP^K11^RSP_K11-Z31-Respond with a List of Candidates

Section: Special Indication for Forecasted Dose

Updated 12/29/2016 11:53

Title*

Special Indication for Forecasted Dose

Content

A veterinarian about to start practicing, Melinda Sandra Benson, is visiting her provider. While administration of the rabies vaccine is not typically recommended for adults, because veterinarians are at increased risk for contracting rabies, when the provider requests a complete immunization history including evaluation and forecast from the local IIS (IISR) using demographics and IDs from the EHR system, a recommendation for the rabies series is included in the response message.

Query Message:

```
MSH|^~\&|wcEHR||IISR|20161001094507-0500||QBP^Q11^QBP_Q11|35869|P|2.8.2||NE|AL||||Z54^CDCPHINVS|wcEHR||IISR  
QPD|Z54^Request Immunization History^CDCPHINVS|16|89076^~~~wcEHR^MR|Benson^Melinda^Sandra~~~L|Flowers~~~~~M|19930121|F|1202 47th Avenue~~~New  
Braunfels^TX^78132^USA^P||PRN^PH~~~830^5559109|N|1  
RCP||1^RD&Record&HL70126
```

Response Message:

```
MSH|^~\&|IISR||wcEHR|20161001094508-0500|RSP^K11^RSP_K11|3695|P|2.8.2||NE|NE||||Z52^CDCPHINVS||IISR|wcEHR  
MSA|AA|35869  
QAK|16|OK|Z54^Request Complete Immunization History^CDCPHINVS  
QPD|Z54^Request Immunization History^CDCPHINVS|16|89076^~~~wcEHR^MR|Benson^Melinda^Sandra~~~L|Flowers~~~~~M|19930121|F|1202 47th Avenue~~~New  
Braunfels^TX^78132^USA^P||PRN^PH~~~830^5559109|N|1  
PID|1||89076^~~~wcEHR^MR~5623^~~~IISR^SR|Benson^Melinda^Sandra~~~L|Flowers~~~~~M|19930121|F||2106-3^White^CDCREC|1202 47th Avenue~~~New  
Braunfels^TX^78132^USA^P||PRN^PH~~~830^5559109|||||2186-5^Not Hispanic or Latino^CDCREC|N|1||||N  
PD1||||||07^Recall only - no calls^HL70215|N|20161001|||A|20161001|20161001  
ORC|RE|778^scEHR|334665^scEHR|||||141^Yeldon^Teresa^Julia~~~~scEHR^L~~~PRN|||225^Montgomery^Elaine~~~~scEHR^L~~~PRN|||||scEHR^South Clinic^HL70362  
RXA|0||20160914|20160914|158^influenza, injectable, quadrivalent^CVX|0.5ml~mL^UCUM||01^New  
Record^NIP001|141^Yeldon^Teresa^Julia~~~~scEHR^L~~~PRN|||||88342034|20170211|SEQ^Seirus^MVX||CP|||||^~~~scEHR  
RXR|C28161^Intramuscular^NCIT/RT^Right Thigh^HL70163  
OBX|1|CWE|30956-7^Vaccine type^LN|1|88^influenza, unspecified formulation^CVX||||F|||20161001  
OBX|2|CWE|59779-9^Immunization schedule used^LN|1|VXC16^ACIP^CDCPHINVS||||F|||20161001  
OBX|3|ID|59781-5^Dose validity^LN|1|Y||||F|||20161001  
OBX|4|CWE|59780-7^Immunization series^LN|1|flu^Standard Influenza Series^L||||F|||20161001  
ORC|RE|9999^IISR  
RXA|0||20161001|20161001|998^no vaccine admin^CVX|999||||||||NA
```

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Section: Interaction Definition

Updated 01/03/2017 11:27

Title*

Interaction Definition

Content

This sequence diagram illustrates the message flow for the Send Immunization Event use case. The initiating system sends one or more immunization events in a VXU message. The trigger may be a new record, an update or delete of an existing record or some other event. The responding system accepts the message and processes it. The responding system sends an acknowledgement message in an ACK message, including any relevant error information.

It is important to note that the messages may pass through intermediaries, such as a Health Information Exchange (HIE). The message comes from the initiating system and the acknowledgement MUST be returned to that initiating system regardless of the number of nodes (or 'hops') in between the two systems.

sd Send Immunization Event

```
sequenceDiagram
    actor Init as Initiating System
    actor Res as Responding System
    Note over Init: Create VXU()
    Init->>Init: Create VXU()
    activate Init
    Note over Init: VXU(Z22)
    deactivate Init
    Init->>Res: Parse HL7()
    activate Res
    Res->>Res: Apply Business Rules()
    deactivate Res
    Res->>Init: ACK(Z23)
```

Figure xxx - Send Immunization Event Sequence Diagram

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Patients
◆ 2.7.7. More Than the Maximum Number of Patients Found
◆ 2.7.8. Message Processing Error Acknowledgement
◆ 2.7.9. Message Rejection Acknowledgement

3. Message Infrastructure
3.1. Profile Components
3.2. Conformance Profiles
◆ [1] VXU^V04^VXU_V04-Z22-Send an Unsolicited Immunization Event
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◆ [5] QBP^Q11^QBP_Q11-Z44-Request an Evaluated Immunization History and Forecast
◆ [6] QBP^Q11^QBP_Q11-Z54-Request a Complete Immunization History With Evaluation and Forecast
◆ [7] RSP^K11^RSP_K11-Z31-Respond with a List of Candidates
◆ [8] RSP^K11^RSP_K11-Z32-Respond with a Complete Immunization History
◆ [9] RSP^K11^RSP_K11-Z33-Respond with a No Person Found Message
◆ [10] RSP^K11^RSP_K11-Z42-Respond with an Evaluated History and Forecast
◆ [11] RSP^K11^RSP_K11-Z52-Respond with a Complete Immunization History With Evaluation and Forecast

3.3. Composite Profiles

Conformance Profile: VXU^V04^VXU_V04

Updated 09/11/2017 10:49

MetaData Definition Delta

Pre-Text Structure Post-Text Conf. Statements Predicates

Context : message segment Field Component

Display Column Verify ADD

Name	Usage	Cardinality	Length	ConfLength	Data Type	Value Set/Single Code	Constant Value	Predicate
1.MSH^IZ:Message Header	R	1 1						
2.SFT:Software Segment	O	0 *						
3.UAC:User Authentication Credential Segment	O	0 1						
4.PID^IZ_01:Patient Identification	R	1 1						
5.PD1^IZ:Patient Additional Demographic	RE	0 1						
6.NK1^IZ:Next of Kin / Associated Parties	RE	0 *						
7.ARV:Access Restriction	O	0 *						
8.PATIENT_VISIT	O	0 1						
9.GT1:Guarantor	O	0 *						
10.INSURANCE	O	0 1						
11.PERSON_OBSERVATION	O	0 1						
12.ORDER	R	1 *						

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- ❖ [11] RSP^K11^RSP_K11-Z52-Respond with a Complete Immunization History With Evaluation and Forecast
- ▼ 3.3.Composite Profiles
- ▼ 3.4.Segments and field descriptions:
 - HL7 2.8.2 ACC --Accident
 - HL7 2.8.2 AL1 --Patient Allergy Information
 - HL7 2.8.2 ARV --Access Restriction
 - HL7 2.8.2 AUT --Authorization Information
 - HL7 2.8.2 DB1 --Disability
 - HL7 2.8.2 DG1 --Diagnosis
 - HL7 2.8.2 DRG --Diagnosis Related Group
 - HL7 2.8.2 DSC --Continuation Pointer
 - HL7 2.8.2 ERR --Error
 - USR 2.8.2 ERR_IZ --Error
 - HL7 2.8.2 EVN --Event Type
 - USR 2.8.2 EVN_IZ --Event Type
 - HL7 2.8.2 GT1 --Guarantor
 - HL7 2.8.2 Hxx --any HL7 segment
 - HL7 2.8.2 IN1 --Insurance
 - USR 2.8.2 IN1_IZ --Insurance
 - HL7 2.8.2 IN2 --Insurance Additional Information
 - HL7 2.8.2 IN3 --Insurance Additional Information, Certification
 - HL7 2.8.2 MSA --Message Acknowledgment
 - USR 2.8.2 MSA_IZ --Message Acknowledgment
 - HL7 2.8.2 MSH --Message Header
 - USR 2.8.2 MSH_IZ --Message Header
 - HL7 2.8.2 NK1 --Next of Kin / Associated Parties
 - USR 2.8.2 NK1_IZ --Next of Kin / Associated Parties
 - HL7 2.8.2 NTE --Notes and Comments
 - HL7 2.8.2 OBX --Observation/Result
 - USR 2.8.2 OBX_IZ_01 --Observation/Result

Segment: MSH_IZ

Updated :09/11/2017 10:49 ,HL7 Version: 2.8.2

Connect To GVT Export Usage Filter Share Verify Close

✓ SAVE

✗ RESET

MetaData

Definition

Delta

%Cross-References

Pre-Text

Structure

Post-Text

Conf. Statements

Predicates

Co-constraints

Context : ● segment ● Field ● Component

Display Column

✓ Verify + ADD

Name	Usage	Cardinality	Length	Conf. Length	Data Type	Value Set/Single Code
	O TO X					
1.Field Separator	R	1	1	1	USR 2.8.2 ST_01	
2.Encoding Characters	R	1	1	4	USR 2.8.2 ST_01	
3.Sending Application	RE	0	1		USR 2.8.2 HD_01	● 0361_01
4.Sending Facility	RE	0	1		USR 2.8.2 HD_01	● 0362_01
5.Receiving Application	RE	0	1		USR 2.8.2 HD_01	● 0361_01
6.Receiving Facility	RE	0	1		USR 2.8.2 HD_01	● 0362_01
7.Date/Time of Message	R	1	1	0	USR 2.8.2 DTM_01	
8.Security	O	0	1	0	HL7 2.8.2 ST	
9.Message Type	R	1	1		USR 2.8.2 MSG_01	
10.Message Control ID	R	1	1	199	USR 2.8.2 ST_01	
11.Processing ID	R	1	1		USR 2.8.2 PT_01	
12.Version ID	R	1	1		USR 2.8.2 VID_01	
13.Sequence Number	O	0	1	0	HL7 2.8.2 NM	
14.Continuation Pointer	O	0	1	180	HL7 2.8.2 ST	

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HL7 2.8.2 DLD --Discharge to Location and Date
HL7 2.8.2 DR --Date/Time Range
HL7 2.8.2 DT --Date
USR 2.8.2 DT_01 --Date
HL7 2.8.2 DTM --Date/Time
USR 2.8.2 DTM_01 --Date/Time
USR 2.8.2 DTM_02 --Date/Time
USR 2.8.2 DTM_03 --Date/Time
HL7 2.8.2 DTN --Day Type and Number
HL7 2.8.2 ED --Encapsulated Data
HL7 2.8.2 EI --Entity Identifier
USR 2.8.2 EI_01 --Entity Identifier
USR 2.8.2 EI_02 --Entity Identifier
HL7 2.8.2 EIP --Entity Identifier Pair
HL7 2.8.2 ERL --Error Location
USR 2.8.2 ERL_01 --Error Location
HL7 2.8.2 FC --Financial Class
HL7 2.8.2 FN --Family Name
USR 2.8.2 FN_01 --Family Name
HL7 2.8.2 FT --Formatted Text Data
HL7 2.8.2 GTS --General Timing Specification
HL7 2.8.2 HD --Hierachic Designator
USR 2.8.2 HD_01 --Hierachic Designator

Data Type: EI_01
Updated: 12/16/2016 15:15, HL7 Version: 2.8.2

MetaData Definition Delta Cross-References

Pre-Text Structure Post-Text Conf. Statements Predicates

Context: Field Component Display Column Verify

Name	Usage	Data Type	Value Set/Single Code	Constant Value	Predicate	Definition Text	Comment
1.Entity Identifier	R	USR 2.8.2 ST_01		+			+
2.Namespace ID	R	USR 2.8.2 IS_01					+
3.Universal ID	RE	USR 2.8.2 ST_01		+			+
4.Universal ID Type	C(R/X)	USR 2.8.2 ID_01	0301_01		If EI.3(Univers...)		+

HL7 Version 2.8.2 Implementation Guide: Immunization Messaging with enhanced query

FILTER OFF

HL7 2.8.2 DLD --Discharge to Location and Date
HL7 2.8.2 DR --Date/Time Range
HL7 2.8.2 DT --Date
USR 2.8.2 DT_01 --Date
HL7 2.8.2 DTM --Date/Time
USR 2.8.2 DTM_01 --Date/Time
USR 2.8.2 DTM_02 --Date/Time
USR 2.8.2 DTM_03 --Date/Time
HL7 2.8.2 DTN --Day Type and Number
HL7 2.8.2 ED --Encapsulated Data
HL7 2.8.2 EI --Entity Identifier
USR 2.8.2 EI_01 --Entity Identifier
USR 2.8.2 EI_02 --Entity Identifier
HL7 2.8.2 EIP --Entity Identifier Pair

Data Type: EI_01
Updated: 12/16/2016 15:15, HL7 Version: 2.8.2

MetaData Definition Delta Cross-References

Pre-Text Structure Post-Text Conf. Statements Predicates

+ ADD CONF STATEMENT

ID	Description	DEL
IZ-3	The value of EI.3(Universal ID) SHALL be equal to an ISO-compliant OID.	DEL
IZ-4	The value of EI.4(Universal ID Type) SHALL be 'ISO'.	DEL

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HL7 Version 2.8.2 Implementation Guide: Immunization Messaging with enhanced query 

  FILTER OFF

Number and Name for Persons
HL7 2.8.2 XON --Extended Composite Name and Identification Number for Organizations
USR 2.8.2 XON_01 --Extended Composite Name and Identification Number for Organizations
Name and Identification Number for Organizations
HL7 2.8.2 XPN --Extended Person Name
USR 2.8.2 XPN_01 --Extended Person Name
USR 2.8.2 XPN_02 --Extended Person Name
HL7 2.8.2 XTN --Extended Telecommunication Number
USR 2.8.2 XTN_01 --Extended Telecommunication Number

▼ 3.6. Value Sets
HL7 2.8.2 0001 --Administrative Sex
USR 2.8.2 0001_01 --Administrative Sex
HL7 2.8.2 0002 --Marital Status
HL7 2.8.2 0003 --Event Type
USR 2.8.2 0003_01 --Event Type
HL7 2.8.2 0004 --Patient Class
USR 2.8.2 0004_01 --Patient Class
HL7 2.8.2 0005 --Race
HL7 2.8.2 0006 --Religion
HL7 2.8.2 0007 --Admission Type
HL7 2.8.2 0008 --Acknowledgment Code
USR 2.8.2 0008_01 --Acknowledgment Code
HL7 2.8.2 0009 --Ambulatory Status
HL7 2.8.2 0010 --Physician ID
HL7 2.8.2 0018 --Patient Type
HL7 2.8.2 0019 --Anesthesia Code
HL7 2.8.2 0021 --Bad Debt Agency Code
HL7 2.8.2 0022 --Billing Status
HL7 2.8.2 0023 --Admit Source
HL7 2.8.2 0032 --Charge/Price Indicator
HL7 2.8.2 0038 --Order status
HL7 2.8.2 0042 --Company Plan Code
HL7 2.8.2 0043 --Condition Code
HL7 2.8.2 0044 --Contract Code
HL7 2.8.2 0045 --Courtesy Code
HL7 2.8.2 0046 --Credit Rating
HL7 2.8.2 0050 --Accident Code
HL7 2.8.2 0051 --Diagnosis Code

Value Set: 0001_01
Updated :12/16/2016 15:15 , HL7 Version: 2.8.2

 SAVE  RESET

 MetaData  Definition  Delta  Cross-References

Pre-Text  Structure Post-Text

Attributes

Extensibility Open Stability Static Content Definition Extensional

Source Code Systems

HL70001  Type and hit <Enter>

Content

Codes Per Page : 30 Apply Code System For Selected Codes     

Filter 

By Value		By Description		By Code System		By Usage	
<input type="checkbox"/>	Value	Description	<input type="checkbox"/>	CodeSystem	Usage	<input type="checkbox"/>	Comments
<input type="checkbox"/>	A	Ambiguous	<input type="checkbox"/>	HL70001			
<input type="checkbox"/>	F	Female	<input type="checkbox"/>	HL70001			
<input type="checkbox"/>	M	Male	<input type="checkbox"/>	HL70001			
<input type="checkbox"/>	N	Not applicable	<input type="checkbox"/>	HL70001			
<input type="checkbox"/>	O	Other	<input type="checkbox"/>	HL70001			
<input type="checkbox"/>	U	Unknown	<input type="checkbox"/>	HL70001			

IGAMT Demo: Overview, Narrative, Structure, Profiling

Messaging with enhanced query

e: VXL Conformance Profile

IG Style Profile Style Table Style

As XML As HTML As Word

Display

HL7

Export in HTML, WORD, and XML

1.4 Key Technical Decisions

- 1.4.1 Use of Vocabulary Standards
- 1.4.2 Conventions
- 1.4.3 Keywords
- 1.4.4 Message Acknowledgement
- 1.4.5 Usage Conformance Testing Recommendations
- 1.4.6 Other Decisions

2 Use Cases

- 2.1 Actors
- 2.2 General Assumptions
- 2.2.1 Assumptions
- 2.2.2 Pre-conditions
- 2.2.3 Post-conditions
- 2.2.4 Errors and Acknowledgements
- 2.3 Use Case 1-Send Immunization Event
- 2.3.1 Context
- 2.3.2 User Story
- 2.3.3 Interaction Definition
- 2.3.4 Dynamic Definition
- 2.3.5 Scenarios
- 2.3.5.1 Sending Success Acknowledgements
- 2.3.5.2 Sending Message Rejection Acknowledgements
- 2.3.5.3 Sending Message Processing Error/Warning Acknowledgements
- 2.3.6 Messaging Capabilities
- 2.3.6.1 Sending Adds
- 2.3.6.2 Sending Updates or Deletions
- 2.3.6.3 Sending Patient Protection Indicator
- 2.3.6.4 Sending Patient Eligibility Status
- 2.3.6.5 Sending Vaccine Funding Source
- 2.3.6.6 Sending Vaccine Information Statements (VIS)
- 2.3.6.7 Sending Administration Refusals
- 2.3.6.8 Sending Partial Administrations
- 2.3.6.9 Sending Adverse Reactions
- 2.3.6.10 Sending Evidence of Immunity
- 2.3.6.11 Sending Contraindications
- 2.3.6.12 Sending Special Indications
- 2.3.6.13 Sending Comments
- 2.3.7 Sample Messages
- 2.3.7.1 Add_Protection_Eligibility_Funding_Source_VIS_Comment
- 2.3.7.2 Update
- 2.3.7.3 Delete
- 2.3.7.4 Refusal
- 2.3.7.5 Partial Administration
- 2.3.7.6 Success Acknowledgment
- 2.3.7.7 Message Rejection Acknowledgement
- 2.3.7.8 Message Processing Error Acknowledgement
- 2.3.7.9 Message Processing Warning Acknowledgement

2.4 Use Case 2-Send Demographics Data Only

- 2.4.1 Context
- 2.4.2 User Story
- 2.4.3 Interaction Definition
- 2.4.4 Dynamic Definition
- 2.4.5 Scenarios
- 2.4.5.1 Returning Success Acknowledgements
- 2.4.5.2 Returning Message Rejection Acknowledgements
- 2.4.5.3 Returning Message Processing Error/Warning Acknowledgements
- 2.4.6 Messaging Capabilities
- 2.4.6.1 Sending New Patient Data
- 2.4.6.2 Sending Updated Patient Data

1.1.1 Purpose

This document (www.hit.org/Release 5.1) is for informational purposes only. It is not intended to be a substitute for professional medical advice, diagnosis, or treatment. The information provided is general in nature and does not apply to all individuals. It is important to consult with a healthcare provider for specific medical advice based on individual circumstances.



HL7 Version 2.8.2 Implementation Guide: Immunization Messaging with enhanced query

2017/09/05 13:43:01

HL7 version 2.8.1

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1. Introduction

The reduction of vaccine-preventable diseases is a major goal of clinical care providers and the Public Health community. The exchange of data between systems which operate at the point of clinical care, including Electronic Health Record systems (EHR-S) and systems which consolidate immunization data is critical to achieving this goal. Immunization information systems (IIS) are defined by the Centers for Disease Control and Prevention (CDC) as confidential, population-based, computerized databases that record all immunization doses administered by participating providers to persons residing within a given geopolitical area. IIS receive and share data on individuals with a number of other systems, including EHR-S and other IIS. This implementation guide documents the electronic data exchange requirements for a number of use cases within the immunization workspace in the US Realm.

Health Level Seven (HL7) is an internationally recognized standard for electronic data exchange between systems housing health care data. The HL7 standard is a key factor that supports the two-way exchange of information because it defines a syntax or grammar for formulating the messages that carry this information. It further describes a standard vocabulary that is used in these messages. It does not depend on specific software, that is, it is platform independent.

Note that the individual who is the recipient of an immunization or who is the subject of an immunization history query can be known by many labels. This includes "client", a term typically used by a public health organizations, or "patient", a term common among EHR systems and provider organizations. For the sake of consistency, this document will use the term "patient" when referring to this individual.

1.1. Purpose

This document represents the collaborative effort of the immunization community to implement inter-system communication of immunization related data. It is based on HL7 Version 2.8.2, as published by the HL7 organization (www.hl7.org). The content of this document is largely based on Release 1.5 of the Implementation Guide for Immunization Messaging published by the American Immunization Registry Association (AIRA) and CDC. Release 1.5 is the latest in a series of implementation guides, the first of which was balloted through HL7 as a "for comment" document. Minor changes have been made to account for the move from version 2.5.1 to version 2.8.2, but otherwise the majority of the content of this document is directly based on the Release 1.5 workflows and specifications.

Improve Requirement Specification

- ❑ Profile Components
 - ❑ “Un-conflate” requirements
 - ❑ Extend requirement specification for new use cases
- ❑ Data Type Specialization
- ❑ Segment Definition Specialization
- ❑ Value Set Definition and Binding
- ❑ Explicit Conformance Statements
- ❑ Expanded Conditional True/False Outcomes
- ❑ Explicit Condition Predicates
- ❑ Co-constraints
- ❑ Understanding of existing conformance constructs
- ❑ Definition and use of Conformance Key Words
- ❑ “a clean-up of v2” → from lessons learned...

IGAMT Demo: Data Flavor

Data Type: HD

Updated :12/13/2016 15:00 ,HL7 Version: 2.5.1

RESET

_MetaData

Definition

Delta

%Cross-References

Pre-Text

Structure

Post-Text

Conf. Statements

Predicates

Context : Field Component

Display Column ▾

Name	Usage	Data Type	Value Set/Single Code	Constant Value	Predicate	Definition Text	Comment
c 1.Namespace ID	0	HL7 2.5.1 IS	0300				
c 2.Universal ID	C	HL7 2.5.1 ST					
c 3.Universal ID Type	C	HL7 2.5.1 ID	0301				

Clone and constrain

HL7 2.5.1 FT --Formatted Text Data

HL7 2.5.1 GTS --General Timing Specification

HL7 2.5.1 HD --Hierarchical DesPARATOR

HL7 2.5.1 ICD --Insurance Definition

HL7 2.5.1 ID --Coded Value Tables

HL7 2.5.1 IS --Coded Value for User-Defined

Create Flavor

Delete

Data Type: HD_DEMO

Updated :12/13/2016 15:00 ,HL7 Version: 2.5.1

_MetaData

Definition

Pre-Text

Structure

Context : Field Component

Name

c 1.Namespace ID

c 2.Universal ID

c 3.Universal ID Type

R

RE

C

X

O

IS

ST

ID

IGAMT Demo: Condition Predicate

(1/2) Create Constraints

Selected Context Tree

- HD
 - [R] Namespace ID
 - [RE] Universal ID
 - [C] Universal ID Type

ADD NEW FREE-TEXT CONSTRAINT ADD NEW PLAIN CONSTRAINT **ADD NEW COMPLEX CONSTRAINT**

If	Node	Verb	Constraint Pattern	Value	
If	2[1] (Universal ID)	is	valued		RESET + ADD

→ NEXT

	Description	True Usage	False Usage
<input checked="" type="checkbox"/>	If HD.2 (Universal ID) is valued	R	X

c 3.Universal ID Type	C(R/X) <input type="button" value="edit"/> <input type="button" value="x"/>	HL7 2.5.1 ID <input type="button" value="edit"/>	<input checked="" type="radio"/> 0301 <input type="button" value="x"/> <input type="button" value="edit"/>	<input checked="" type="radio"/> If HD.2 (Univer... <input type="button" value="edit"/> <input type="button" value="x"/>	<input style="background-color: #ccc; border: none; width: 20px; height: 20px;" type="button" value="+"/>	<input style="background-color: #ccc; border: none; width: 20px; height: 20px;" type="button" value="+"/>
-----------------------	---	--	---	--	---	---

IGAMT Demo: Conformance Statement

Selected Context Tree

- ▶ D HD
 - ◆ C 1. [R] Namespace ID
 - ◆ C 2. [RE] Universal ID
 - ◆ C 3. [C] Universal ID Type

Conformance Statements of HD

ID	Description (<input type="checkbox"/> view assertion)	
DEMO_01	The value of HD-2 (Universal ID) SHALL be formatted with 'ISO-compliant OID'.	

ID	Node	Verb	Constraint Pattern	Value		
DEMO_01	2[1] (Universal ID)	SHALL be	formatted value	ISO-compliant OID		

Data Type: HD_DEMO

Updated :12/13/2016 15:00 ,HL7 Version: 2.5.1

SAVE

RESET

MetaData	Definition	Delta	Cross-References
Pre-Text	Structure	Post-Text	Conf. Statements
			Predicates

+ ADD CONF.STATEMENT

ID	Description	
DEMO_01	The value of HD-2 (Universal ID) SHALL be formatted with 'ISO-compliant OID'.	

IGAMT Demo: Data Flavor, Condition Predicate, & Conformance Statement

Data Type: HD_DEMO

Updated: 12/13/2016 15:00 , HL7 Version: 2.5.1

SAVE

RESET

MetaData Definition Delta %Cross-References

Pre-Text

Structure

Post-Text

Conf. Statements

Predicates

Context : Field Component

Display Column

Verify

Name	Usage <input type="radio"/> O TO X	Usage		Data Type	Value Set/Single Code	Constant Value	Predicate	Definition Text	Comment
		O	TO X						
1.Namespace ID	R	<input type="radio"/>	<input type="radio"/>	HL7 2.5.1 IS	<input checked="" type="radio"/> 0300 <input type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2.Universal ID	RE	<input type="radio"/>	<input type="radio"/>	HL7 2.5.1 ST		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3.Universal ID Type	C(R/X) <input type="checkbox"/> <input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	HL7 2.5.1 ID	<input checked="" type="radio"/> 0301 <input type="checkbox"/>		<input checked="" type="radio"/> If HD.2 (Univer... <input type="checkbox"/> <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Bind to element

DEMO

FILTER OFF	
update	
3.3.Composite Profiles	
3.4.Segments and field descriptions:	
HL7 2.5.1 GT1 -Guarantor	
HL7 2.5.1 INT -Insurance	
HL7 2.5.1 IN2 --Insurance Additional Information	
HL7 2.5.1 IN3 --Insurance Additional Information, Certification	
HL7 2.5.1 MSH -Message Header	
USR 2.5.1 MSH_DEMO -Message Header	
HL7 2.5.1 NK1 --Next of Kin / Associated Parties	
HL7 2.5.1 NTE --Notes and Comments	
HL7 2.5.1 OBX -Observation/Result	
HL7 2.5.1 ORC -Common Order	
HL7 2.5.1 PD1 -Patient Additional Demographic	
HL7 2.5.1 PID --Patient Identification	
USR 2.5.1 PID_DEMO --Patient Identification	
HL7 2.5.1 PV1 --Patient Visit	
HL7 2.5.1 PV2 --Patient Visit - Additional Information	
HL7 2.5.1 RXA --Pharmacy/Treatment Administration	
HL7 2.5.1 RXR -Pharmacy/Treatment Route	
HL7 2.5.1 SFT -Software Segment	
HL7 2.5.1 TQ1 --Timing/Quantity	
HL7 2.5.1 TQ2 --Timing/Quantity Relationship	
3.5.Datatypes	
HL7 2.5.1 AUI --Authorization Information	
HL7 2.5.1 CE --Coded Element	
HL7 2.5.1 CNE --Coded with No Exceptions	

Segment: MSH_DEMO

Updated: 10/13/2017 16:33 , HL7 Version: 2.5.1

SAVE RESET

MetaData Definition Delta %Cross-References

Pre-Text Structure Post-Text Conf. Statements Predicates Co-constraints

Context : segment Field Component

Display Column Verify ADD

Name	Usage <input type="radio"/> O TO X	Usage		Cardinality	Data Type	Value Set/Single Code	Constant Value	Predicate	Definition Text
		O	TO X						
1.Field Separator	R	<input type="radio"/>	<input type="radio"/>	1	1	HL7 2.5.1 ST		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2.Encoding Characters	R	<input type="radio"/>	<input type="radio"/>	1	1	HL7 2.5.1 ST		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3.Sending Application	R	<input type="radio"/>	<input type="radio"/>	1	1	USR 2.5.1 HD_DEMO	<input checked="" type="radio"/> 0361 <input type="checkbox"/>		<input checked="" type="checkbox"/>
1.Namespace ID	R					HL7 2.5.1 IS	<input checked="" type="radio"/> 0300 <input type="checkbox"/>		
2.Universal ID	RE					HL7 2.5.1 ST		<input checked="" type="checkbox"/>	
3.Universal ID Type	C(R/X)					HL7 2.5.1 ID	<input checked="" type="radio"/> 0301 <input type="checkbox"/>	<input checked="" type="radio"/> If HD.2 (Univer... <input type="checkbox"/> <input checked="" type="checkbox"/>	
4.Sending Facility	O	<input type="radio"/>	<input type="radio"/>	0	1	HL7 2.5.1 HD	<input checked="" type="radio"/> 0362 <input type="checkbox"/>		<input checked="" type="checkbox"/>
1.Namespace ID	O					HL7 2.5.1 IS	<input checked="" type="radio"/> 0300 <input type="checkbox"/>		
2.Universal ID	C					HL7 2.5.1 ST		<input checked="" type="checkbox"/>	
3.Universal ID Type	C					HL7 2.5.1 ID	<input checked="" type="radio"/> 0301 <input type="checkbox"/>		
5.Receiving Application	O	<input type="radio"/>	<input type="radio"/>	0	1	HL7 2.5.1 HD	<input checked="" type="radio"/> 0361 <input type="checkbox"/>		<input checked="" type="checkbox"/>

IGAMT Demo: Import, Create Value Sets and Value Set Binding

HL7 Version 2.8.2 Implementation Guide: Immunization Messaging with enhanced query 

  FILTER OFF

 Connect To GVT  Export Usage Filter  Share  Verify  Close

Value Set: NIP003_01
Updated :12/16/2016 15:15

 MetaData  Definition  Delta  Cross-References

Pre-Text  Structure Post-Text

Attributes

Extensibility Open Stability Static Content Definition Extensional

Source Code Systems

LN  Type and hit <Enter>

Content

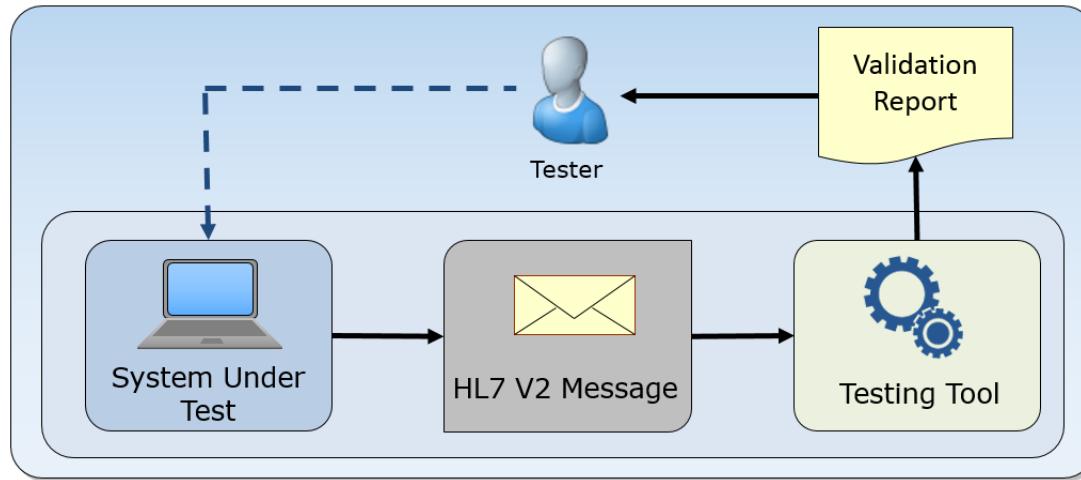
Codes Per Page : 30

Apply Code System For Selected Codes     

Filter 

By Value		By Description		By Code System		By Usage	
<input type="checkbox"/>	Value	<input type="checkbox"/>	Description	<input type="checkbox"/>	CodeSystem	<input type="checkbox"/>	Usage
<input type="checkbox"/>	29769-7	<input type="checkbox"/>	Date Vaccine Information Statement Pres	<input type="checkbox"/>	LN	<input type="checkbox"/>	R
<input type="checkbox"/>	30944-3	<input type="checkbox"/>	Date of vaccination temporary contraindic	<input type="checkbox"/>	LN	<input type="checkbox"/>	P
<input type="checkbox"/>	30945-0	<input type="checkbox"/>	Vaccination contraindication/precaution	<input type="checkbox"/>	LN	<input type="checkbox"/>	P
<input type="checkbox"/>	30946-8	<input type="checkbox"/>	Date vaccination contraindication/precau	<input type="checkbox"/>	LN	<input type="checkbox"/>	P
<input type="checkbox"/>	30956-7	<input type="checkbox"/>	Type [Identifier] Vaccine (Vaccine group or	<input type="checkbox"/>	LN	<input type="checkbox"/>	P

Context-free Testing



- HL7 v2 message validation example

- ❑ Sender-oriented testing
- ❑ No Test Cases provided
- ❑ Context (Test Scenario, etc.) is unknown to validation tool
- ❑ May be used to test any message created by an EHR
- ❑ Provides a simple and convenient method for testing message structure and most vocabulary

Context-free Validation

NIST Immunization Test Suite 1.0.0

Home 1. SOAP Envelope 2. SOAP Connectivity 3. HL7 Context-free 4. HL7 Context-based Documentation About Preferences

Profiles Help

VXU-Z22

- ACK-Z23
- QBP-Z34
- QBP-Z44
- RSP-Z31
- RSP-Z32
- RSP-Z33
- RSP-Z42

Profile: VXU-Z22

Validation Report Profile Viewer ValueSets

Message Tree

- MSH[1]:Message Header R[1,1]
- PID[1]:Patient Identification R[1,1]
 - PID[1-1]:Set ID - PID R[1,1]
 - PID[1-3]:Patient Identifier List R[1,*]
 - PID[1-5]:Patient Name R[1,*]
 - PID[1-6]:Mother's Maiden Name RE[0,1]
 - PID[1-7]:Date/Time of Birth R[1,1]
 - PID[1-8]:Administrative Sex R[1,1]
 - Y
 - PID[1-10]:Race RE[0,*]
 - PID[1-11]:Patient Address RE[0,*]
 - PID[1-13]:Phone Number - Home RE[0,*]
 - PID[1-22]:Ethnic Group RE[0,1]
- PD1[1]:Patient Additional Demographic RE[0,1]
- NK1[1]:Next of Kin / Associated Parties RE[0,*]
- ORC[1]:Common Order R[1,1]
- RXA[1]:Pharmacy/Treatment Administration R[1,1]
- RXR[1]:Pharmacy/Treatment Route RE[0,1]
- OBX[1]:Observation/Result R[1,1]
- OBX[2]:Observation/Result R[1,1]
- OBX[3]:Observation/Result R[1,1]
- OBX[4]:Observation/Result R[1,1]

Message Content 4s DQA Validate Load Example Browse Download Clear

```

1 MSH ^& & Test EHR Application | X68 | NIST Test Iz Reg | 20120701082240-0500 | VXU V04^VXU V04|NIST-1
2 PID 1 | D26376273^NIST MPI^MR | Snow^Madelynn^Ainsley^L | Lam^Morgan^AA^M|20070706^T|2076-8'
3 PD1 ||| | 02^Reminder/Recall - any method^HL70215||| | A|20120701|20120701
4 NK1 1 | Lam^Morgan^AA^L | NTH^Mother^HL70063|32 Prescott Street Ave^Warwick^MA^02452^USA^L | PRN^F
5 ORC RE | IZ-783274^NDA| | | I-23432^Burden^Donna^AA^NIST-AA-1^AA^PRN|57422^RADON^NICHOLAS^F
6 RXA 0 | 1|20120814| | 33332-0010-01^Influenza, seasonal, injectable, preservative free^NDC|0.5|mLN
7 RXR C28161^Intramuscular^NCIT|LD^Left Arm^HL70163
8 OBX 1|CE|64994-7^Vaccine funding program eligibility category^LN|1|V05^VFC eligible - Federally
9 OBX 2|CE|30956-7^vaccine type^LN|2|88^Influenza, unspecified formulation^CVX| | | F
10 OBX 3|TS|29768-9^Date vaccine information statement published^LN|2|20120702| | | F
11 OBX 4|TS|29769-7^Date vaccine information statement presented^LN|2|20120814| | | F

```

Message Validation Result Remove Duplicates Report

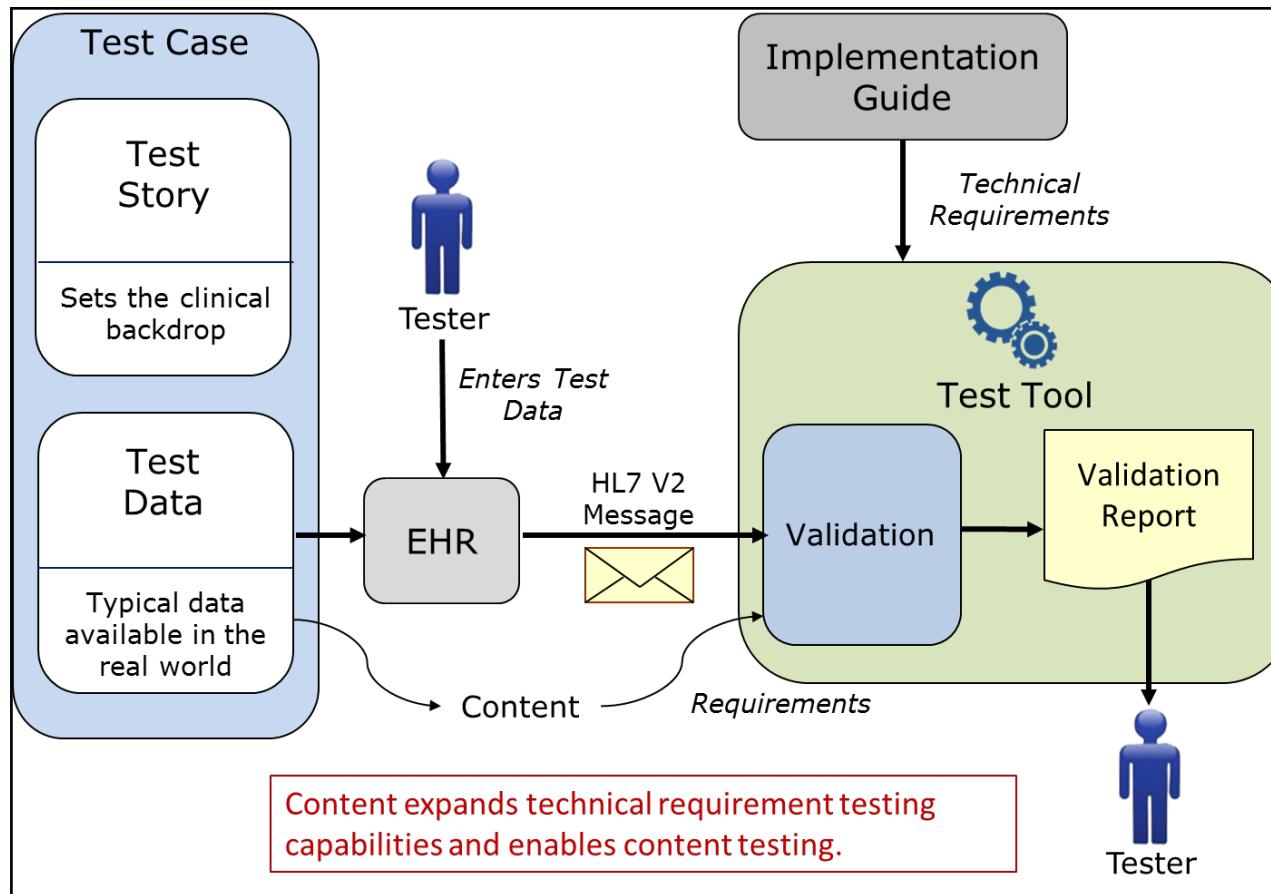
2 Errors **17 Warnings** **20 Alerts**

2 All **1 Value Set** **1 R-Usage**

Highlight All

Path	Description	Line #
PID[1-8][1]	The value 'Y' at location Field PID-8 (Administrative Sex) is not member of the value set HL70001_IZ	2
OBX[3]-11[1]	The required Field OBX-11 (Observation Result Status) is missing	10

Context-based Testing



- Test scenario and data given
- Expands the scope of testing
- Type of testing used in ONC EHR-S certification testing
- Capability Testing

Context-based Testing

Description
A two month old male infant, Russell Clinton Richardson, is brought to the West Clinic for a well child visit by his mother Maria Elizabeth Richardson (nee Billington) and his father John William Richardson. A clinic staff member collects basic patient demographic information including name, date of birth and sex. A clinic provider, Wilma Thomas (physician ID 654) reviews the patient's vaccination history and determines that the child previously received Hepatitis B vaccine 1 day after birth and 1 month after birth. The staff member determines that the patient needs DTaP, Hib, IPV, Rotavirus and Pneumococcal vaccinations. Because of the patient's status of Native American, he qualifies for all Vaccine For Children (VFC) supplied vaccines under the status of VFC eligible #6 American Indian/Alaska Native. The parents are given 5 Vaccine Information Sheets (VIS) to review. After reading them, they agree that the child should receive all the vaccinations recommended. They also agree that the data should be shared once it is incorporated into the local IIS. Appropriate doses of DTaPHibIPV (Pediatric Rotavirus, HemoTetrix, Pneumococcal Prevnar 13) are selected from the clinical's stock of publicly funded vaccines. A clinician, Lily Jackson (ID 7824) prepares and administers the doses to the patient and then enters the data into the EHR and transmits it to the IIS.
Comments
No Comments
PreCondition
No PreCondition
PostCondition
No PostCondition
Test Objectives
No Test Objectives
Evaluation Criteria
No evaluation criteria
Notes to Testers
No Note

Patient Information	
Element	Data
Patient Name	Russell Clint Richardson
Mother's Maiden Name	Billington
ID Number	3123
Date/Time of Birth	04/15/2015
Administrative Sex	Male
Patient Address 1	543 Blount Drive Bozeman MT 59715 USA
Local Number	(406)555-7690
Race1	American Indian or Alaska Native
Ethnic Group	Not Hispanic or Latino
Birth Order	1
Immunization Registry Information	
Element	Data
Immunization Registry Status	A
Immunization Registry Status Effective Date	04/15/2015
Publicity Code	Recall only - no calls
Publicity Code Effective Date	06/24/2015
Protection Indicator	No
Protection Indicator Effective Date	06/24/2015
Guardian or Responsible Party[*]	
Element	Data
Name	Maria Elizabeth Richardson
Relationship	Mother
Address1	543 Blount Drive Bozeman MT 59715 USA
Phone Number	(406)555-7690
Guardian or Responsible Party - 1	
Element	Data
Name	John William Richardson
Relationship	Father
Address1	543 Blount Drive Bozeman MT 59715 USA
Phone Number	(406)555-8299

MSH			
Location	Data Element	Data	Categorization
MSH-1	Field Separator		Value-Profile Fixed
MSH-2	Encoding Characters	~<	Value-Profile Fixed
MSH-3	Sending Application		
MSH-4	Sending Facility		
MSH-3..1	Namespace ID	wcApp	Presence-Content Indifferent
MSH-3..2	Universal ID		Indifferent
MSH-3..3	Universal ID Type		Indifferent
MSH-4..1	Namespace ID	wcEHR	Presence-Content Indifferent
MSH-4..2	Universal ID		Indifferent
MSH-4..3	Universal ID Type		Indifferent
MSH-5	Receiving Application		
MSH-5..1	Namespace ID	issApp	Presence-Content Indifferent
MSH-5..2	Universal ID		Indifferent
MSH-5..3	Universal ID Type		Indifferent
MSH-6	Receiving Facility		
MSH-6..1	Namespace ID	IIS	Presence-Content Indifferent
MSH-6..2	Universal ID		Indifferent
MSH-6..3	Universal ID Type		Indifferent
MSH-7	Date/Time Of Message		
MSH-7..1	Time	20150624073733.994	Presence-System Generated
MSH-7..2	Message Type	0500	
MSH-9	Message Code	VXU	Value-Profile Fixed
MSH-9..1	Trigger Event	V04	Value-Profile Fixed
MSH-9..2	Message Structure	VXU_V04	Value-Profile Fixed
MSH-10	Message Control ID	12462	Presence-System Generated
MSH-11	Processing ID		
MSH-11..1	Processing ID	P	Presence-Content Indifferent
MSH-12	Version ID		
MSH-12..1	Version ID	2.5.1	Value-Profile Fixed
MSH-15	Accept Acknowledgment Type	ER	Value-Profile Fixed
MSH-16	Application Acknowledgment Type	AL	Value-Profile Fixed
MSH-21	Message Profile Identifier		
MSH-21..1	Entity Identifier	Z22	Value-Test Case Fixed
MSH-21..2	Namespace ID	CDCPHINVS	Value-Test Case Fixed
MSH-21..3	Universal ID		Indifferent
MSH-21..4	Universal ID Type		Indifferent
MSH-22	Sending Responsible Organization		

Test Story

- Test Story gives the test scenario
- Test Data indicates the real-world data
- Content Assertions indicates how content will be validated

Test Data

Content Assertions

Context-based Testing

- Defines the criteria that are used by the test tool to assess the test data that populate each element in a message
- Tells the Tester if the test data in a specific field can be changed, the source of the test data, and to what level of precision the validation tool will assess the data

Test Data Categorization	Description	Testing Implications	Comments
Indifferent	No test data are provided as part of the test case.	No additional validation.	The validation is indifferent to the presence of data or specific content in the message element. Meaning: Value or don't value this data element.
Presence	Test data are provided as part of the test case; content indifferent.	Validated for the presence of data.	The specific content is not pertinent to the test cases for the purpose of testing. The test data can be modified. Meaning: Value this data element.
Presence-Length	Test data are provided as part of the test case; minimum length of the content is expected.	Validate for the presence of data to a minimum length.	The specific content is not pertinent to the test cases for the purpose of testing, but the length of the content is. The test data can be modified as long as the minimum length of the test data is maintained. Meaning: Value this data element to a minimum length.
Value	Test data are provided as part of the test case; specific content is provided and expected.	Validate for the presence of data and for specific content.	The specific content (or choice of content) is provided and is expected to be present in the message. The test data can only be modified with data in the allowable data set. In some cases the set is a single constant. Meaning: Value this data element with the test data options provided.
Non-presence	No test data are provided as part of the test case and no content for this message element is expected.	Validate for the non-presence of data.	Content is not specified in the test case and is not expected to be present in the message. Meaning: Don't value this data element.

Context-based Validation

NIST Immunization Test Suite 1.0.0

Home 1. SOAP Envelope 2. SOAP Connectivity 3. HL7 Context-free **4. HL7 Context-based** Documentation About Preferences

Test Selection Test Execution

Test Cases

- ONC 2015 Test Plan
 - Administration Group
 - IZ-AD-1_Admin_Child
 - 1.IZ-AD-1_1_Send_V04_Z22**
 - 2.IZ-AD-1_2_Receive_ACK_Z23
 - IZ-AD-2_Admin_Adult
 - 1.IZ-AD-2_1_Send_V04_Z22
 - 2.IZ-AD-2_2_Receive_ACK_Z23
 - IZ-AD-3_No_Consent
 - 1.IZ-AD-3_1_Send_V04_Z22
 - 2.IZ-AD-3_2_Receive_ACK_Z23
 - IZ-AD-4_Delete_Record
 - 1.IZ-AD-4_1_Send_V04_Z22
 - 2.IZ-AD-4_2_Receive_ACK_Z23
 - IZ-AD-5_Refusal
 - IZ-AD-6_Update_Record
 - IZ-AD-7_Historical_IIS_Error
 - IZ-AD-8_Admin_IIS_Warning
 - IZ-AD-9_Admin_IIS_2Warnings
 - IZ-AD-10_Historical_IIS_SysError
 - Evaluated History and Forecast Group
 - IZ-QR-1_Query_Child
 - 1.IZ-QR-1_1_Query_Q11_Z44
 - 2.IZ-QR-1_2_Response_K11_Z42
 - IZ-QR-2_Query_Adult
 - 1.IZ-QR-2_1_Query_Q11_Z44
 - 2.IZ-QR-2_2_Response_K11_Z42
 - IZ-QR-3_Query_No_Patients
 - 1.IZ-QR-3_1_Query_Q11_Z44
 - 2.IZ-QR-3_2_Response_NF_K11_Z33
 - IZ-QR-4_Query_Too_Many
 - 1.IZ-QR-4_1_Query_Q11_Z44

TestStep: IZ-AD-1.1_Send_V04_Z22

Test Story Test Data Specification Message Content Example Message **Load Test Step**

FULL Description Comments Pre Condition Post Condition Test Objectives Evaluation Criteria Notes for Testers

Description
A two month old male infant, Russell Clinton Richardson, is brought to a clinic for a well child visit by his mother Maria Elizabeth Richardson (nee Billington) and his father John William Richardson. A clinic staff member collects basic patient demographic information including name, date of birth and sex. A clinic provider, Wilma Thomas (physician ID 654) reviews the patient's vaccination history and determines that the child previously received Hepatitis B vaccine 1 day after birth and 1 month after birth. The staff member determines that the patient needs DTaP, Hib, IPV, Rotavirus and Pneumococcal vaccinations. Because of the patient's status of Native American, he qualifies for all Vaccine For Children (VFC) supplied vaccines under the status of VFC eligible - American Indian/Alaska Native. The parents are given 5 Vaccine Information Sheets (VIS) to review. After reading them, they agree that the child should receive all the vaccinations recommended. They also agree that the data should be shared once it is incorporated into the local IIS. They indicate that reminders and recalls may be sent by any method. Appropriate doses of DTaP/Hib/IPV (Pentacel), Rotavirus (RotaTeq) and Pneumococcal (Prevnar 13) are selected from the clinic's stock of publicly funded vaccines. A clinician, Lily Jackson (ID 7824) prepares and administers the doses to the patient and then enters the data into the EHR and transmits it to the IIS.

Comments
No Comments

Pre Condition
No PreCondition

Post Condition
No PostCondition

Test Objectives
Create an administration message containing historical (using CVX) and new administrations (using NDC)
Support for next of kin
Support for patient consent
Support for VIS
Support for funding source
Support for VFC data.

Download PDF

Context-based Validation

Test Selection Test Execution Current Test Step: IZ-AD-1_1_Send_V04_Z22

ONC 2015 Test Plan / Administration Group / IZ-AD-1_Admin_Child / IZ-AD-1.1_Send_V04_Z22

1. Test Step: IZ-AD-1.1_Send_V04_Z22

Validation Report Profile Viewer ValueSets

Message Tree

- MSH[1]:Message Header R[1,1]
- PID[1]:Patient Identification R[1,1]
- PD[1]:Patient Additional Demographic RE[0,1]
- NK[1]:Next of Kin / Associated Parties RE[0,*]
- NK[2]:Next of Kin / Associated Parties RE[0,*]
- ORC[1]:Common Order R[1,1]
- RXA[1]:Pharmacy/Treatment Administration R[1,1]
- RXR[1]:Pharmacy/Treatment Route RE[0,1]
- OBX[1]:Observation/Result R[1,1]
- OBX[2]:Observation/Result R[1,1]
- OBX[3]:Observation/Result R[1,1]
- OBX[4]:Observation/Result R[1,1]
- OBX[5]:Observation/Result R[1,1]
- OBX[6]:Observation/Result R[1,1]
- OBX[7]:Observation/Result R[1,1]
- OBX[8]:Observation/Result R[1,1]
- ORC[2]:Common Order R[1,1]
- RXA[2]:Pharmacy/Treatment Administration R[1,1]
- RXR[2]:Pharmacy/Treatment Route RE[0,1]
- OBX[9]:Observation/Result R[1,1]
- OBX[10]:Observation/Result R[1,1]
- OBX[11]:Observation/Result R[1,1]
- OBX[12]:Observation/Result R[1,1]
- ORC[3]:Common Order R[1,1]
- RXA[3]:Pharmacy/Treatment Administration R[1,1]
- RXR[3]:Pharmacy/Treatment Route RE[0,1]
- OBX[13]:Observation/Result R[1,1]
- OBX[14]:Observation/Result R[1,1]
- OBX[15]:Observation/Result R[1,1]
- OBX[16]:Observation/Result R[1,1]
- ORC[4]:Common Order R[1,1]
- RXA[4]:Pharmacy/Treatment Administration R[1,1]
- ORC[5]:Common Order R[1,1]

Message Content 4s

```
1 MSH|^~\&|NISTEHRAPP|NISTEHRFAC|NISTIISAPP|NISTIISFAC|20150624073733.994-0500||VXU^V04^VXU_V04|NIST-IZ-AD-1.1_Send_V04_Z22||P|2.5.1~
2 PID|1||3123|^NIST-MPI-1^MR|Richardson^Russell^Clint^A^L|Billington^A^M|20150415|X||I002-5^American Indian or Alaska Native^
3 PD|1||02^Reminder/recall - any method|HL70215|N|20150624|||A|20150415|20150624
4 NK1|1|Richardson^Maria^Elizabeth^A^L|NTH^Mother^HL70063|543 Blount Drive^Bozeman^MT^59715^USA^P|PRN^PH^406-5557690
5 NK1|2|Richardson^John^William^A^L|FTH^Father^HL70063|543 Blount Drive^Bozeman^MT^59715^USA^P|PRN^CP^406-5558299
6 ORC RE|3140^NIST-AA-I2-2|38766^NIST-AA-I2-2|||||7824^Jackson^Lily^Suzanne^A^NIST-PI-1^L^A^PRN||654^Thomas^Wilma^Elizabeth^A^
7 RXA|0|1|20150624||X49281-0560-05^Pentacei^NDC|0.5_ml^L^UCM||00^New Record|NIP001|7824^Jackson^Lily^Suzanne^A^NIST-PI-1^L^A^PR
8 RXR|C28161^Intramuscular^NCIT|RT^Right Thigh|HL70163
9 OBX|1|CE|30963-3^Vaccine Funding Source^LN|1|VX50^Public^CDCPHINVS|||||F|||20150624
10 OBX|2|CE|64994-7^Vaccine Funding Program Eligibility^LN|2|V04^VFC Eligible - American Indian/Alaska Native^HL70064|||||F|||20150624
11 OBX|3|CE|69764-9^Document Type^LN|3|253088698300001721111108^Polio VIS^cdcgsv1vis|||||F|||20150624
12 OBX|4|DT|29769-7^Date Vis Presented^LN|3|20150624|||F|||20150624
13 OBX|5|CE|69764-9^Document Type^LN|4|25308869830000591102020^Hepatitis B VIS^cdcgsv1vis|||||F|||20150624
14 OBX|6|DT|29769-7^Date Vis Presented^LN|4|20150624|||F|||20150624
15 OBX|7|CE|69764-9^Document Type^LN|5|253088698300003511070517^Diphtheria/Tetanus/Pertussis (DtaP) VIS^cdcgsv1vis|||||F|||20150624
16 OBX|8|DT|29769-7^Date Vis Presented^LN|5|20150624|||F|||20150624
17 ORC RE|8681^NIST-AA-I2-2|65138^NIST-AA-I2-2|||||7824^Jackson^Lily^Suzanne^A^NIST-PI-1^L^A^PRN||654^Thomas^Wilma^Elizabeth^A^
18 RXA|0|1|20150624||00006-4047-20^RotaTeq^NDC|2.0_ml^L^UCM||00^New Record|NIP001|7824^Jackson^Lily^Suzanne^A^NIST-PI-1^L^A^PRN
19 RXR|C38288^Oral^NCIT|
20 OBX|1|CE|30963-3^Vaccine Funding Source^LN|1|VX50^Public^CDCPHINVS|||||F|||20150624
21 OBX|2|CE|64994-7^Vaccine Funding Program Eligibility^LN|2|V04^VFC Eligible - American Indian/Alaska Native^HL70064|||||F|||20150624
22 OBX|3|CE|69764-9^Document Type^LN|3|25308869830001961150415^Rotavirus VIS^cdcgsv1vis|||||F|||20150624
23 OBX|4|DT|29769-7^Date Vis Presented^LN|3|20150624|||F|||20150624
24 ORC RE|7491^NIST-AA-I2-2|79539^NIST-AA-I2-2|||||7824^Jackson^Lily^Suzanne^A^NIST-PI-1^L^A^PRN||654^Thomas^Wilma^Elizabeth^A^
25 |
```

Message Validation Result Help Remove Duplicates Report

4 Errors	10 Warnings	55 Alerts
4 All	2 Value Set	2 Content Failure
Highlight All		
Path Description Line #		
PID[1]-8[1]	The value 'X' at location Field PID-8 (Administrative Sex) is not member of the value set HL70001_IZ	2
RXA[1]-5[1,1]	The value 'X49281-0560-05' at location Component RXA-5.1 (Identifier) is not member of the value set NDC	7
RXA[1]-5[1,1]	Content - Invalid content (based on test case fixed data). The value 'X49281-0560-05' at 'Component RXA-5.1 (Identifier)' does not match the expected value '49281-0560-05'.	7
PID[1]-8[1]	Content - Invalid content (based on test case fixed data). The value 'X' at 'Field PID-8 (Administrative Sex)' does not match the expected value 'M'.	2

Context-based Validation

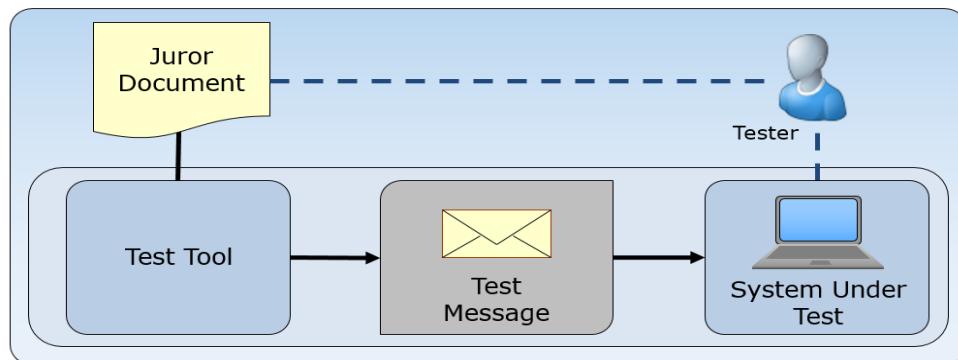
□ Validation Results with Content Violations

The screenshot shows a validation results interface with the following details:

- Message Validation Result: [Help](#)
- Buttons: [Remove Duplicates](#) [Report](#)
- Counts: 2 Errors, 11 Warnings, 55 Alerts
- Filters: 2 All, 2 Content Failure
- Checkboxes: Highlight All
- Table:

Path	Description	Line #
PID[1]-11[1]	Content - Expected content is missing. The empty value at PID-11.5(Zip or Postal Code) is expected to be present.	2
RXA[1]-5[1].1	Content - Invalid content (based on test case fixed data). The value '00005-1971-01' at 'Component RXA-5.1 (Identifier)' does not match the expected value '49281-0560-05'.	7

Inspection Testing

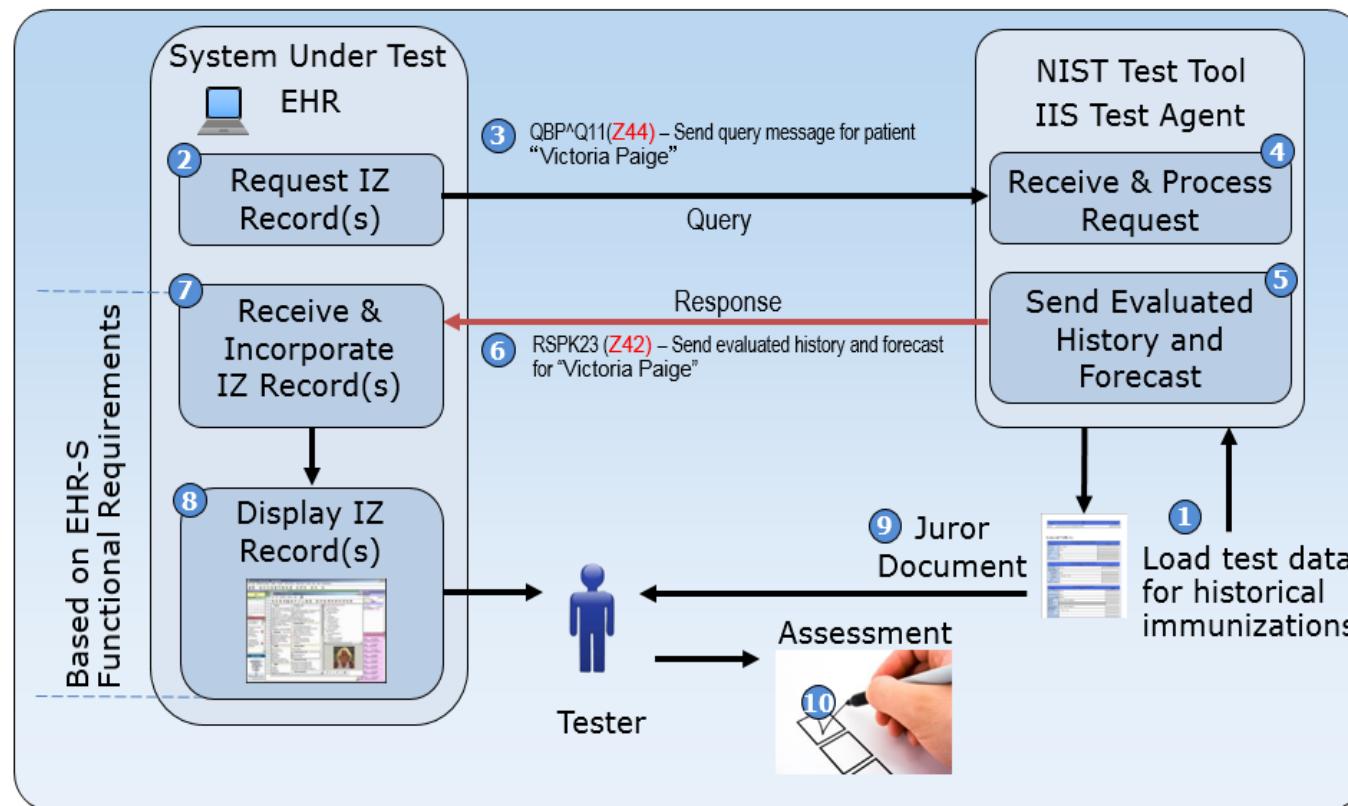


Patient Information				
Patient Identifier	Patient Name	DOB	Gender	Tester Comment
171122	Cameron A Fairchild	02/14/2009	Male	
When displayed in the EHR with the Evaluated Immunization History and Immunization Forecast, these patient demographics data may be derived from either the received immunization message or the EHR patient record. When displaying demographics from the patient record, the EHR must be able to demonstrate a linkage between the demographics in the message (primarily the patient ID in PID-3.1) and the patient record used for display to ensure that the message was associated with the appropriate patient.				
Evaluated Immunization History and Immunization Forecast				
Immunization Schedule Used		Tester Comment		
ACIP				
Evaluated Immunization History				
Vaccine Group	Vaccine Administered	Date Administered	Valid Dose	Validity Reason
Hep B NOS	Hep B Peds NOS	04/15/2009	YES	
HIB NOS	HIB PRP-T	03/14/2009	NO	Too Young
Hep B NOS	DTAP-Hep B-IPV	10/11/2009	YES	
IPV	DTAP-Hep B-IPV	10/11/2009	YES	
DTAP	DTAP-Hep B-IPV	10/11/2009	YES	
Hep B NOS	Hep BPEDS	04/11/2010	YES	
MMR	MMR	04/15/2010	YES	
* "Completion Status" refers to the status of the dose of vaccine administered on the indicated date and may be interpreted as "Dose Status". A status of "Complete" means that the vaccine dose was "completely administered" as opposed to "partially administered".				

- Receiver-oriented Testing
- Use of an inspection (Juror) Document
- Can be used for Incorporation and Display Testing
- Test Tool provides the stimulus
- Can have levels of storage requirements

Test Receiving Applications

- ❑ Can be used to test incorporation and display
- ❑ Proctor uses Inspection Check List (Juror Document)



Test Receiving Applications

- Import Test Message
- Tool provides Inspection Check List

NIST Immunization Test Suite 1.0.0

The screenshot shows the NIST Immunization Test Suite 1.0.0 interface. At the top, there's a navigation bar with links for Home, SOAP Envelope, SOAP Connectivity, HL7 Context-free, HL7 Context-based, Documentation, About, and Preferences. Below the navigation bar, a sub-menu bar shows Test Selection, Test Execution, Current Test Step: IZ-AD-1_1_Send_V04_Z22, and a Download PDF button.

The main area is divided into two main sections: "Test Cases" on the left and "TestStep: IZ-QR-1.2_Response_K11_Z42" on the right.

Test Cases: This sidebar lists various test cases categorized under ONC 2015 Test Plan, Administration Group, and Evaluated History and Forecast Group. Some items are marked with a checkmark (e.g., 1.IZ-AD-1_1_Send_V04_Z22, 2.IZ-AD-1_2_Receive_ACK_Z23).

TestStep: IZ-QR-1.2_Response_K11_Z42: This section contains tabs for Test Story, Test Data Specification, Message Content, Juror Document, Example Message, and a Download PDF button.

Patient Information: A table showing patient details: Patient Identifier (171122), Patient Name (Cameron A Fairchild), DOB (02/14/2009), Gender (Male). A note states: "When displayed in the EHR with the Evaluated Immunization History and Immunization Forecast, these patient demographics data may be derived from either the received immunization message or the EHR patient record. When displaying demographics from the patient record, the EHR must be able to demonstrate a linkage between the demographics in the message (primarily the patient ID in PID-3.1) and the patient record used for display to ensure that the message was associated with the appropriate patient."

Evaluated Immunization History and Immunization Forecast: This section includes tables for "Immunization Schedule Used" (ACIP) and "Evaluated Immunization History".

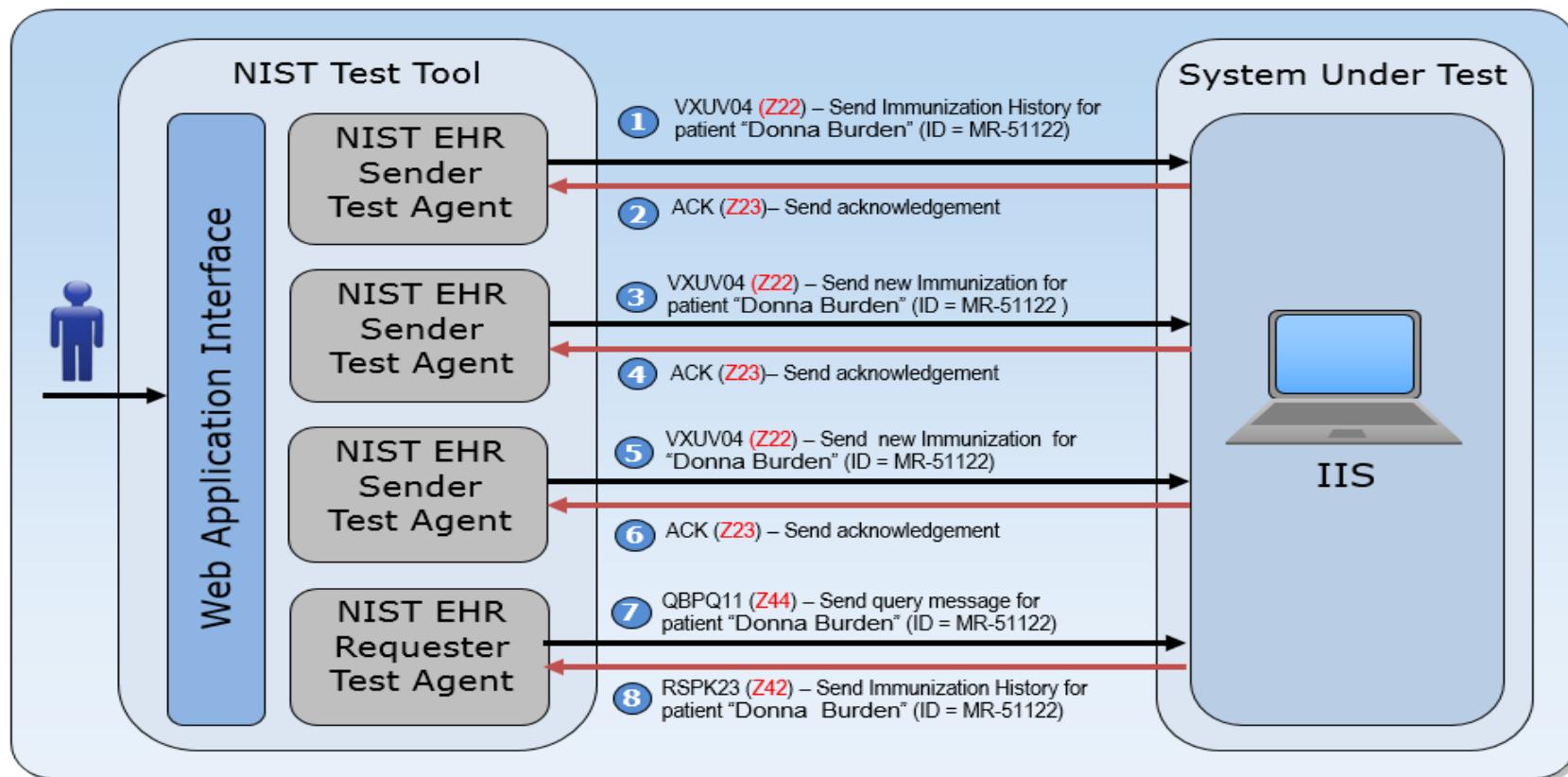
Vaccine Group	Vaccine Administered	Date Administered	Valid Dose	Validity Reason	Completion Status*	Tester Comment
Hep B NOS	Hep B Peds NOS	04/15/2009	YES		Complete	
HIB NOS	HIB PRP-T	03/14/2009	NO	Too Young	Complete	
Hep B NOS	DTAP-Hep B-IPV	10/11/2009	YES		Complete	
IPV	DTAP-Hep B-IPV	10/11/2009	YES		Complete	
DTAP	DTAP-Hep B-IPV	10/11/2009	YES		Complete	
Hep B NOS	Hep BPEDS	04/11/2010	YES		Complete	
MMR	MMR	04/15/2010	YES		Complete	

* "Completion Status" refers to the status of the dose of vaccine administered on the indicated date and may be interpreted as "Dose Status". A status of "Complete" means that the vaccine dose was "completely administered" as opposed to "partially administered".

Immunization Forecast: This section is currently empty.

Test Functional Requirements

- Create scenarios to invoke a capability of the SUT
- Use context-based testing to validate expected content in the response message



View Messaging Requirements

NIST Immunization Test Suite 1.0.0

Home 1 SOAP Envelope 2 SOAP Connectivity 3 HL7 Context-free 4 HL7 Context-based Documentation About Preferences

Profiles Help

VXU-Z22 ACK-Z23 QBP-Z34 QBP-Z44 RSP-Z31 RSP-Z32 RSP-Z33 RSP-Z42

Profile: VXU-Z22

Validation Report Profile Viewer ValueSets

R,RE,C (only) R,RE,C,O,X (All) Concise View Expanded View

G Group S Segment F Datatype C Component S SubComponent

FULL MSH SFT PID PD1 NK1 PV1 PV2 GT1 IN1 IN2 IN3 ORC TQ1 TQ2 RXA RXR OBX NTE

Datatypes Conformance Statements

Name	Usage	Cardinality	Length	Datatype	ValueSet	Predicate	Conformance Statement
RXA-1:Give Sub-ID Counter	R	[1, 1]	[1, 1]	NM			IZ-28 : The value of RX...
RXA-2:Administration Sub-ID Counter	R	[1, 1]	[1, 1]	NM			IZ-29 : The value of RX...
RXA-3:Date/Time Start of Administration	R	[1, 1]	[1, 26]	TS_NZ			IZ-TS_NZ : The value o...
RXA-4:Date/Time End of Administration	O	[0, 1]	[1, 26]	TS			IZ-30 : If RXA-4.1 (Tim...
RXA-5:Administered Code	R	[1, 1]	[1, 250]	CE_IZ	CVX NDC		
RXA-5.1:Identifier	R		[1,50]	ST			
RXA-5.2:Text	RE		[1,999]	ST			
RXA-5.3:Name of Coding System	R		[1,20]	ID	HL70396_IZ		
RXA-5.4:Alternate Identifier	O		[1,50]	ST			
RXA-5.5:Alternate Text	C (RE/X)		[1,999]	ST			If CE.4 (A...
RXA-5.6:Name of Alternate Coding System	C (R/X)		[1,20]	ID	HL70396_IZ		If CE.4 (A...
RXA-6:Administered Amount	R	[1, 1]	[1, 20]	NM			IZ-49 : If the value of R...
RXA-7:Administered Units	C (R/X)	[0, 1]	[1, 250]	CE_IZ	UCUM		If the val...

View Vocabulary Requirements

NIST Immunization Test Suite 1.0.0

Home 1 SOAP Envelope 2 SOAP Connectivity 3 HL7 Context-free 4 HL7 Context-based Documentation About Preferences

Profiles Help

VXU-Z22
 ACK-Z23
 QBP-Z34
 QBP-Z44
 RSP-Z31
 RSP-Z32
 RSP-Z33
 RSP-Z42

Profile: VXU-Z22

Validation Report Profile Viewer ValueSets

ValueSet Collections

CDC-HL7-IZ CDC-IZ HL7

Search

Binding Identifier	Value Set Name
CDCREC_E_IZ	Ethnic Group
CDCREC_R_IZ	Race
CVX	Codes for Vaccines administered
MVX	Manufacturers of vaccines
NCIT	Route of administration
NDC	NDC Unit of Use
NIP001	Immunization information source
NIP002	Substance refusal reason
NIP003	Observation identifiers

Value Set Information

Binding Identifier: CVX

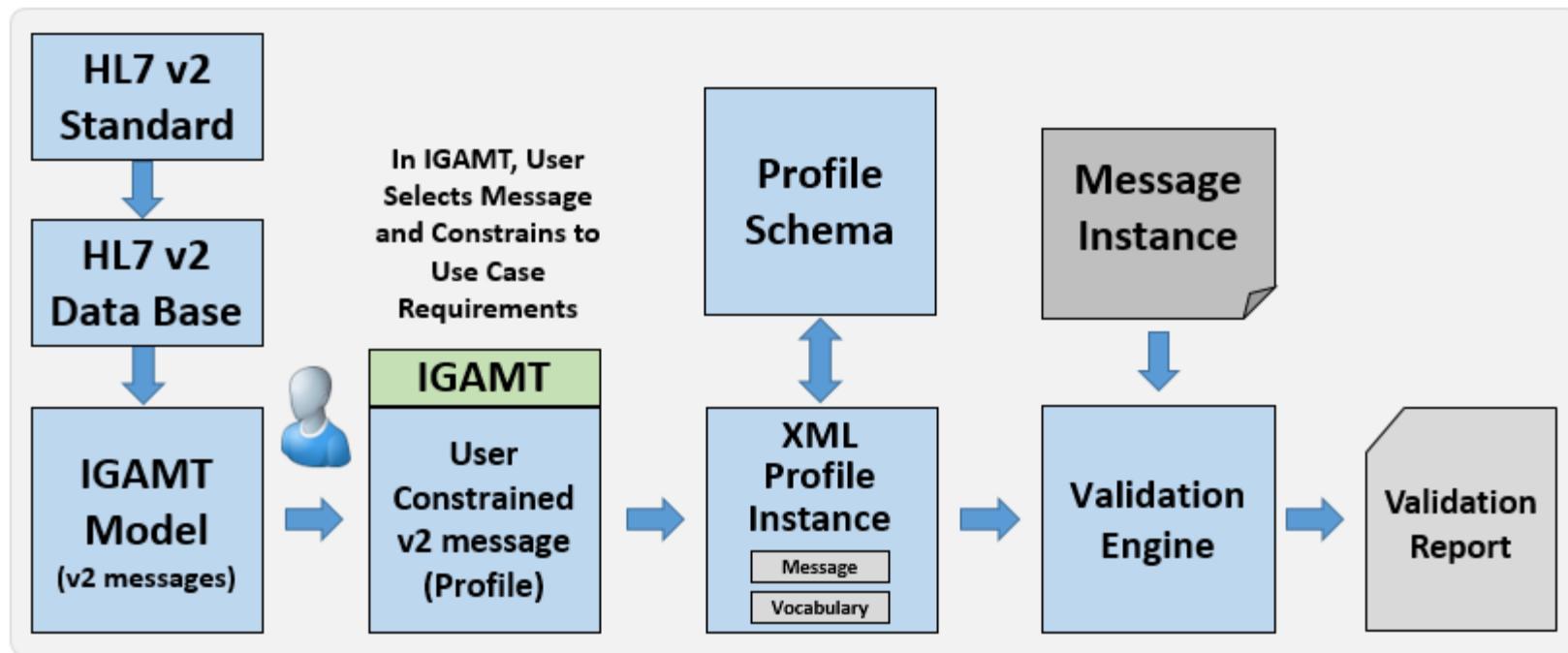
Value Set Name: Codes for Vaccines administered

Value Set Elements

Search

Code	Code System	Description
01	CVX	DTP
02	CVX	OPV
03	CVX	MMR
04	CVX	M/R
05	CVX	measles
06	CVX	rubella

Validation Process



IGAMT and GVT Demo: Validation Tools (1:08)

Conformance Profile: VXU^V04^VXU_V04

Connect To GVT

Select Conformance Profile(s)

ID	Name	Description
Z22	VXU^V04^VXU_V04	Send an Unsolicited Immunization Event
Z23	ACK^Varies*ACK	Respond with a General Acknowledgement
Z24	ADT^A31^ADT_A05	Send Demographics Only Content
Z34	QBP^Q11^QBP_Q11	Request a Complete Immunization History
Z44	QBP^Q11^QBP_Q11	Request an Evaluated Immunization History and Forecast
Z54	QBP^Q11^QBP_Q11	Request a Complete Immunization History With Evaluation and Forecast
Z31	RSP^K11^RSP_K11	Respond with a List of Candidates
Z32	RSP^K11^RSP_K11	Respond with a Complete Immunization History

NEXT

Connect To GVT

Login information on GVT at <https://hl7v2.gvt.nist.gov/gvt/>

Username *

robnist

Password *

Forgot password
Create account.

BACK SEND

Add Profiles

Profile Group

Profile Group (Select or create Profile Group)

IZ

Profiles: *

Name	Identifier	Description	Type	Event	StructID
VXU^V04^VXU_V04	Z22	Send an Unsolicited Immunization Event	VXU	V04	VXU_V04

Save Cancel and Close

IGAMT and GVT Demo: Validation Tools

NIST GVT 1.0.0-beta

NIST HL7 V2 General Validation Tool

Home Context-free Context-based Documentation About

Type: My Profiles Profile Group: IZ

Profiles Help

IZ VXU^V04^VXU_V04

Profile: VXU^V04^VXU_V04

Validation Report Profile Viewer ValueSets

R,RE,C (only) R,RE,C,O,X (All) Concise View Expanded View G Group S Segment F Field D Datatype C Component S SubComponent

Name	Usage	Cardinality	Length	Datatype	ValueSet	Predicate	Conformance Statement
RXA-1:Give Sub-ID Counter	R	[1, 1]	[0, 0]	NM_IZ01_2-8-2			IZ-28 : The value of RXA-1 (Give Sub-ID Counter)
RXA-2:Administration Sub-ID Counter	R	[1, 1]	[0, 0]	NM_IZ01_2-8-2			IZ-29 : The value of RXA-2 (Administration Sub-ID Counter)
RXA-3:Date/Time Start of Administration	R	[1, 1]	[0, 0]	DTM_IZ02_2-8-2			
RXA-4:Date/Time End of Administration	R	[1, 1]	[0, 0]	DTM_IZ02_2-8-2			IZ-30 : The value of RXA-4 (Date/Time End of Administration)
RXA-5:Administered Code	R	[1, 1]	[0, 0]	CWE_IZ01_2-8-2	CVX_01		
RXA-6:Administered Amount	R	[1, 1]	[0, 0]	NM_IZ01_2-8-2			IZ-48 : If the value of RXA-20 (Completion Status)
RXA-7:Administered Units	C (R/X)	[0, 1]	[0, 0]	CWE_IZ01_2-8-2	UCUM_01	If the value of RXA-6(Administered Amount)	
RXA-9:Administration Notes	C (R/O)	[0, 1]	[0, 0]	CWE_IZ01_2-8-2	NIP001_01	If the value of RXA-20(Administration Notes)	
RXA-10:Administering Provider	C (RE/O)	[0, 1]	[0, 0]	XCN_IZ01_2-8-2		[If the value of RXA-9.1(Identifying Information)]	
RXA-15:Substance Lot Number	C (R/O)	[0, *]	[0, 0]	ST_IZ01_2-8-2		[If the value of RXA-9.1(Identifying Information)]	
RXA-16:Substance Expiration Date	C (RE/O)	[0, 1]	[0, 0]	DTM_IZ03_2-8-2		[If the value of RXA-9.1(Identifying Information)]	
RXA-17:Substance Manufacturer Name	C (R/O)	[0, 1]	[0, 0]	CWE_IZ01_2-8-2	MVX_01	[If the value of RXA-9.1(Identifying Information)]	
RXA-18:Substance/Treatment Refusal Reason	C (R/X)	[0, *]	[0, 0]	CWE_IZ01_2-8-2	NIP002_01	If the value of RXA-20(Completion Status)	
RXA-20:Completion Status	RE	[0, 1]	[2, 2]	ID_IZ01_2-8-2	0322_01_2-8-2		IZ-32 : If RXA-18 (Substance/Treatment Refusal Reason)
RXA-21:Action Code - RXA	C (R/X)	[0, 1]	[1, 1]	ID_IZ01_2-8-2	0206_01_2-8-2	If the value of RXA-5.1(Identifying Information)	

TCAMT: Creating Test Cases and Context-based Testing

TCAMT 2.0.0-beta-1

Home Test Plans Profiles Documentation About Glossary Configuration Download Center Issues Hello, Rob Snelick

List of Test Plans

+ NEW + IMPORT JSON

#	Name	Description	Version	Date	Actions
1	New TestPlan			2017/05/03 16:37:18	
2	Demo	wqe		2017/05/03 16:37:18	
3	Demo12	wqe	init	2017/05/03 16:37:18	
4	EIP	Case Reporting for Food Net		2017/07/19 09:42:17	
5	NIST	Demo Test Plan	1.0	2017/10/04 13:42:55	

TCAMT 2.0.0-beta-1

Home Test Plans Profiles Documentation About Glossary Configuration Download Center Issues Hello, Rob Snelick

Test Plan: NIST

TEST PLANS EXPORT SAVE

TestPlan Navigation Tree

- TP NIST
 - GP [1]Submit Immunizations
 - IC [2]Send Child Immunization
 - TS [1] VXU
 - TS [2] ACK
 - IC [3]Send Adult Immunization
 - TS [1] VXU
 - TS [2] ACK
 - GP [4]Query/Response
 - IC [5]Consolidated Records
 - TS [1] Prime Data Base
 - TS [2] Query
 - TS [3] Receive Response
 - TS [4] Inspect Display

Test Plan: NIST

METADATA PUBLISHED COVER PAGE TEST STORY

TestPlan Metadata

Name	NIST	Description	Demo Test Plan
Type	Isolated	Version	1.0
Domain	Demo	Date	2017/10/04 13:42:55
Integration Profiles		GVT Status	This TestPlan is not published on GVT.

Test Story Configuration

Empty Content in TestStory will be contained

TestPlan Test Story Configuration

TCAMT: Creating Test Cases and Context-based Testing

TCAMT 2.0.0-beta-1

Home Test Plans Profiles Documentation About Glossary Configuration Download Center Issues Hello, Rob Snelick ▾

Test Plan: NIST

CONNECT WITH GVT TEST PLANS EXPORT TEMPLATE SAVE

TestPlan Navigation Tree

- TP NIST
 - GP [1]Submit Immunizations
 - TC [2]Send Child Immunization
 - TS [1] VXU
 - TS [2] ACK
 - IC [3]Send Adult Immunization
 - TS [1] VXU
 - TS [2] ACK
 - GP [4]Query/Response
 - IC [5]Consolidated Records
 - OTS [1] Prime Data Base
 - TS [2] Query
 - OTS [3] Receive Response
 - OTS [4] Inspect Display

+ NEW ER7 MESSAGE TEMPLATE

```
1 MSH|^~\&|NISTEHRAPP|NISTEHRFAC|NISTIISAPP|NISTIISFAC|20150624093847.804-0500||VXU^V04^VXU_V04|NIST-IZ-AD-3.1_Send_V04_Z22|F
2 PID|1||89778^^^NIST-MPI-1^MR||Benton^Katherine^^^^L|Jones^^^^M|20031221|F||2106-3^White^CDCREC|89 West 21st Ave^^Bozeman
3 PD1|||||||01^No reminder/recall^HL70215|Y|20150624|||A|20031221|20150624
4 NK1|1|Benton^Kari^Michelle^^^^L|MTH^Mother^HL70063|89 West 21st Ave^^Bozeman|^MT59715^USA^P|^PRN^PH^^406^5554019
5 ORC|RE|5237^NIST-AA-IZ-2|31309^NIST-AA-IZ-2|||||7824^Jackson^Lily^Suzanne^^^^NIST-PI-1^L^^PRN||654^Thomas^Wilma^Elizabeth
6 RXA|0|1|20150624||00006-4119-01^GARDASIL 9^NDC|0.5|mL^mL^UCUM||00^New Record^NIP001~06^Whatever^NIP001|7824^Jackson^Lily^Suzanne
7 RXR|C28161^Intramuscular^NCIT|RD^Right Deltoid^HL70163
8 OBX|1|CE|30963-3^Vaccine Funding Source^LN|1|VXC50^Public^CDCPHINVS|||||F|||20150624
9 OBX|2|CE|64994-7^Vaccine Funding Program Eligibility^LN|2|V05^VFC Eligible - Underinsured^HL70064|||||F|||20150624|||VXC40
10 OBX|3|CE|69764-9^Document Type^LN|3|253088698300029511161202^HPV Vaccine VIS^cdcs1vis|||||F|||20150624
11 OBX|4|DT|29769-7^Date Vis Presented^LN|3|20150624||rwqrwer|ewrwen~2nd|ewrewr||F|||20150624
12 OBX|1|CE|30963-3^Vaccine Funding Source^LN|1|VXC50^Public^CDCPHINVS|||||F|||20150624
13 OBX|2|CE|64994-7^Vaccine Funding Program Eligibility^LN|2|V05^VFC Eligible - Underinsured^HL70064|||||F|||20150624|||VXC40
14 OBX|3|CE|69764-9^Document Type^LN|3|253088698300029511161202^HPV Vaccine VIS^cdcs1vis|||||F|||20150624
15 OBX|4|DT|29769-7^Date Vis Presented^LN|3|QQQQQQQQQ|||||F|||20150624
16
```

Hide IG List: Hide Templates List:

IG Documents Tree

Filter by structure Filter by Name Filter by Identifier

IP IZ Profiles

CP ACK-Return an Acknowledgement-Z23
CP RSP_K11-Return a List of Candidates-Z31
CP RSP_K11-Return Evaluated History and Forecast-Z42

TCAMT: Creating Test Cases and Context-based Testing

TCAMT 2.0.0-beta-1

Home Test Plans Profiles Documentation About Glossary Configuration Download Center Issues

Hello, Rob Snelick

Test Plan: NIST

CONNECT WITH GVT TEST PLANS EXPORT TEMPLATE SAVE

TestPlan Navigation Tree

- TP NIST
 - GP [1]Submit Immunizations
 - TC [2]Send Child Immunization
 - TS [1] VXU
 - TS [2] ACK
 - TC [3]Send Adult Immunization
 - TS [1] VXU
 - TS [2] ACK
 - GP [4]Query/Response
 - TC [5]Consolidated Records
 - OTS [1] Prime Data Base
 - TS [2] Query
 - OTS [3] Receive Response
 - OTS [4] Inspect Display

Hide IG List: Hide Templates List:

IG Documents Tree

Filter by structure Filter by Name Filter by Identifier

- IP IZ Profiles
 - CP ACK-Return an Acknowledgement-Z23
 - CP RSP_K11-Return a List of Candidates-Z31
 - CP RSP_K11-Return Evaluated History and Forecast-Z42
 - CP QBP_Q11-Request Evaluated Immunization History and Forecast Query-Z44
 - CP VXU_V04-Z22-VXU-V04-Desctption1-Z22
 - CP RSP_K11-Return Complete Immunization History-Z32
 - CP RSP_K11-Return an acknowledgement with no person records-Z33

Test Step: VXU

METADATA TEST STORY HL7 ENCODED MESSAGE TEST DATA VALIDATION STD/NIST XML SUPPLEMENT

TestStep Test Story Configuration Default

Description

A two month old male infant, Russell Clinton Richardson, is brought to a clinic for a well child visit by his mother Maria Elizabeth Richardson (nee Billington) and his father John William Richardson. A clinic staff member collects basic patient demographic information including name, date of birth and sex. A clinic provider, Wilma Thomas (physician ID 654) reviews the patient's vaccination history and determines that the child previously received Hepatitis B vaccine 1 day after birth and 1 month after birth. The staff member determines that the patient needs DTaP, Hib, IPV, Rotavirus and Pneumococcal vaccinations. Because of the patient's status of Native American, he qualifies for all Vaccine For Children (VFC) supplied vaccines under the status of VFC eligible - American Indian/Alaska Native. The parents are given 5 Vaccine Information Sheets (VIS) to review. After reading them, they agree that the child should receive all the vaccinations recommended. They also agree that the data should be shared once it is incorporated into the local IIS. They indicate that reminders and recalls may be sent by any method. Appropriate doses of DTaP/Hib/IPV (Pentacel), Rotavirus (RotaTeq) and Pneumococcal (Prevnar 13) are selected from the clinic's stock of publicly funded vaccines. A clinician, Lily Jackson (ID 7824) prepares and administers the doses to the patient and then enters the data into the EHR and transmits it to the IIS

Comments

Pre-condition

Post-Condition

Test Objectives

Evaluation Criteria

TCAMT: Creating Test Cases and Context-based Testing

Test Plan: NIST

- └ [1] Send Child Immunization
- └ TC [2] Send Child Immunization
 - TS [1] VXU
 - TS [2] ACK
- └ TC [3] Send Adult Immunization
 - TS [1] VXU
 - TS [2] ACK
- └ GP [4] Query/Response
- └ TC [5] Consolidated Records
 - TS [1] Prime Data Base
 - TS [2] Query
 - TS [3] Receive Response
 - TS [4] Inspect Display

Hide IG List: Hide Templates List:

IG Documents Tree

Filter by structure ID | Filter by Name | Filter by Identifier

- └ IP IHE IG
 - CP ADT_A01-ADT^A04^ADT_A01-DefaultA01Identifier
 - CP ACK_-ACK^Varies^ACK_-DefaultIdentifier
 - CP ADT_A01-ADT^A01^ADT_A01-DefaultA01Identifier
 - CP ADT_A01-ADT^A08^ADT_A01-DefaultA01Identifier

HL7 Version 2.8.2 Implementation Guide:

Immunization Messaging

- CP RSP_K11-RSP^K11^RSP_K11-Z42
- CP RSP_K11-RSP^K11^RSP_K11-Z31
- CP RSP_K11-RSP^K11^RSP_K11-Z32
- CP ACK-ACK^Varies^ACK-Z23

Templates

Test Data Categorization Templates

- └ Message Templates
- └ Segment Templates

ER7 Templates

- └ Er7 Message Templates
- └ Segment Line Templates

[CONNECT WITH GVT](#) TEST PLANS EXPORT TEMPLATE SAVE

ALL USAGES R/R/C ONLY

USAGE ▾

+ NEW TESTDATA CATEGORIZATION TEMPLATE FOR MESSAGE

Segments List

Selected Segment

+ NEW TESTDATA CATEGORIZATION TEMPLATE FOR SEGMENT

+ NEW SEGMENT LINE TEMPLATE

Hide IG List: Hide Templates List:

EXPAND ALL COLLAPSE ALL

Path	Name	Usage	Value	Test Data Cate.	Action
RXA-1	Give Sub-ID Counter	R	0	Value-Profile Fixed	-
RXA-2	Administration Sub-ID Counter	R	1	Value-Test Case Fi	-
▶ RXA-3	Date/Time Start of Administration	R			-
▶ RXA-4	Date/Time End of Administration	O			-
▼ RXA-5	Administered Code	R			-
RXA-5.1	Identifier	R	00006-4119-01 00006-4119-01	Value-Test Case Fi	-
RXA-5.2	Text	RE	GARDASIL 9	Presence-Test Cas	-
RXA-5.3	Name of Coding System	R	NDC	Value-Test Case Fi	-
RXA-5.4	Alternate Identifier	O		Indifferent	-
RXA-5.5	Alternate Text	C (R/X)		Indifferent	-
RXA-5.6	Name of Alternate Coding System	C (R/X)		Indifferent	-
RXA-6	Administered Amount	R	0.5	Value-Test Case Fi	-
▶ RXA-7	Administered Units	C (R/X)			-

TCAMT: Creating Test Cases and Context-based Testing

▼ TestData Categorization List

Path	Name	TestData Categorization	Data	Constraints
ORDER[1].RXA[1].6[1]	Administered Amount	Value-Test Case Fixed	0.5	<ul style="list-style-type: none"> • ORDER[1].RXA[1].6[1] (Administered Amount) SHOULD be presented. • ORDER[1].RXA[1].6[1] (Administered Amount) SHOULD be 0.5
PID[1].5[1].2[1]	Given Name	Presence-Content Indifferent	Katherine	
PID[1].12[1]	County Code	NonPresence		<ul style="list-style-type: none"> • PID[1].12[1] (County Code) SHOULD NOT be presented.
PID[1].8[1]	Administrative Sex	Value-Test Case Fixed	F	<ul style="list-style-type: none"> • PID[1].8[1] (Administrative Sex) SHOULD be F
PID[1].5[1].7[1]	Name Type Code	Value-Test Case Fixed	L	<ul style="list-style-type: none"> • PID[1].5[1].7[1] (Name Type Code) SHOULD be L
ORDER[1].RXA[1].15[1]	Substance Lot Number	Value-Test Case Fixed	795441	<ul style="list-style-type: none"> • ORDER[1].RXA[1].15[1] (Substance Lot Number) SHOULD be presented. • ORDER[1].RXA[1].15[1] (Substance Lot Number) SHOULD be 795441
ORDER[1].RXA[1].2[1]	Administration Sub-ID Counter	Value-Test Case Fixed	1	<ul style="list-style-type: none"> • ORDER[1].RXA[1].2[1] (Administration Sub-ID Counter) SHOULD be presented. • ORDER[1].RXA[1].2[1] (Administration Sub-ID Counter) SHOULD be 1
ORDER[1].RXA[1].5[1].1[1]	Identifier	Value-Test Case Fixed List	["00006-4119-01"]	<ul style="list-style-type: none"> • ORDER[1].RXA[1].5[1].1[1] (Identifier) SHOULD be presented. • ORDER[1].RXA[1].5[1].1[1] (Identifier) SHOULD be one of 00006-4119-01
ORDER[1].RXA[1].5[1].2[1]	Text	Presence-Test Case Proper	GARDASIL 9	<ul style="list-style-type: none"> • ORDER[1].RXA[1].5[1].2[1] (Text) SHOULD be presented.
ORDER[1].RXA[1].5[1].3[1]	Name of Coding System	Value-Test Case Fixed	NDC	<ul style="list-style-type: none"> • ORDER[1].RXA[1].5[1].3[1] (Name of Coding System) SHOULD be presented. • ORDER[1].RXA[1].5[1].3[1] (Name of Coding System) SHOULD be NDC

TCAMT: Creating Test Cases and Context-based Testing

Metadata	Test Story	HL7 Encoded Message	Test Data	Validation	Std/NIST XML	Supplement Documents
					Context Free Context Based	

TCAMT: Creating Test Cases and Context-based Testing

Test Step: VXU

METADATA

TEST STORY

HL7 ENCODED MESSAGE

TEST DATA

VALIDATION

STD/NIST XML

SUPPLEMENT DOCUMENTS

Message Content

FULL

MSH

PID

PD1

NK1

ORC

RXA

RXR

OBX[*]

▶ MSH[1]

▶ PID[1]

▶ PD1[1]

▶ NK1[1]

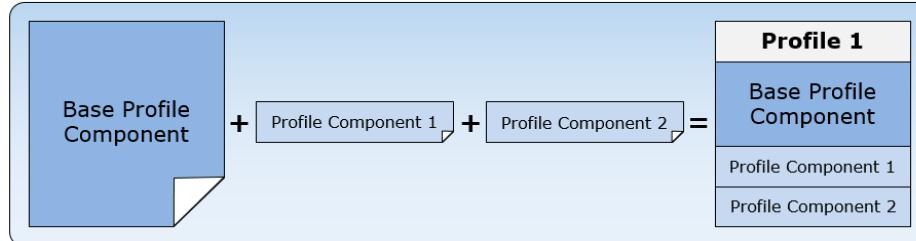
▶ ORDER[1].ORC[1]

▼ ORDER[1].RXA[1]

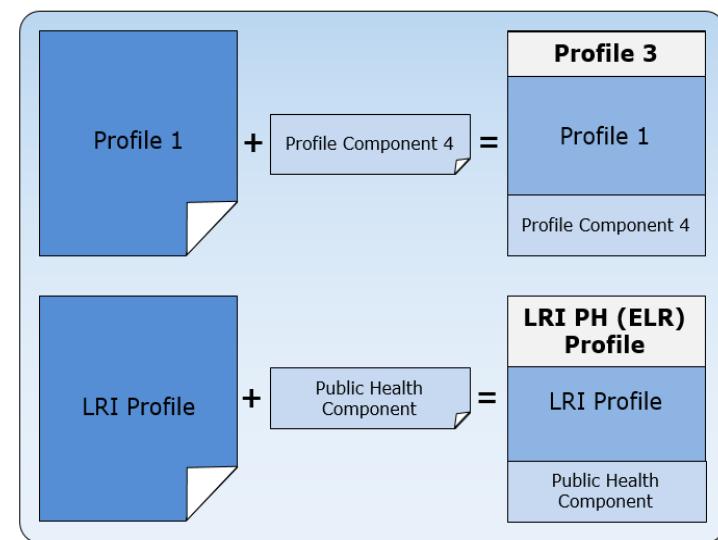
Location	Data Element	Data	Categorization
RXA-1	Give Sub-ID Counter	0	
RXA-2	Administration Sub-ID Counter	1	Value-Test Case Fixed
RXA-3	Date/Time Start of Administration		
RXA-3.1	Time	20150624	
RXA-5	Administered Code		
RXA-5.1	Identifier	00006-4119-01	Value-Test Case Fixed List
RXA-5.2	Text	GARDASIL 9	Presence-Test Case Proper
RXA-5.3	Name of Coding System	NDC	Value-Test Case Fixed
RXA-5.5	Alternate Text		Indifferent
RXA-5.6	Name of Alternate Coding System		Indifferent

Profile Components

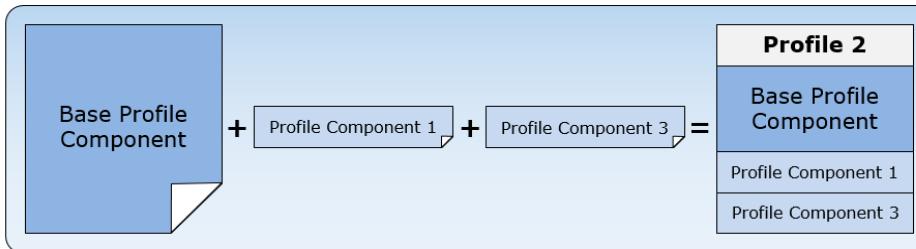
Use as Building Blocks



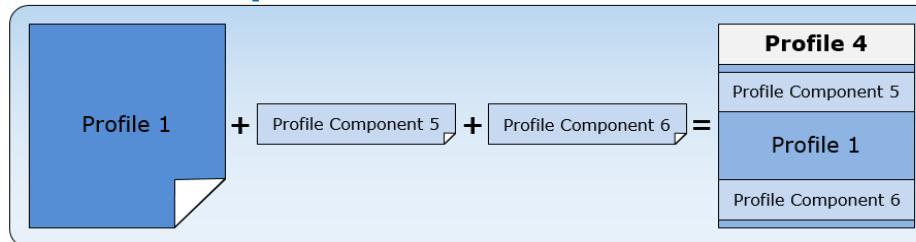
Expanding a Use Case



Reuse and Replacement



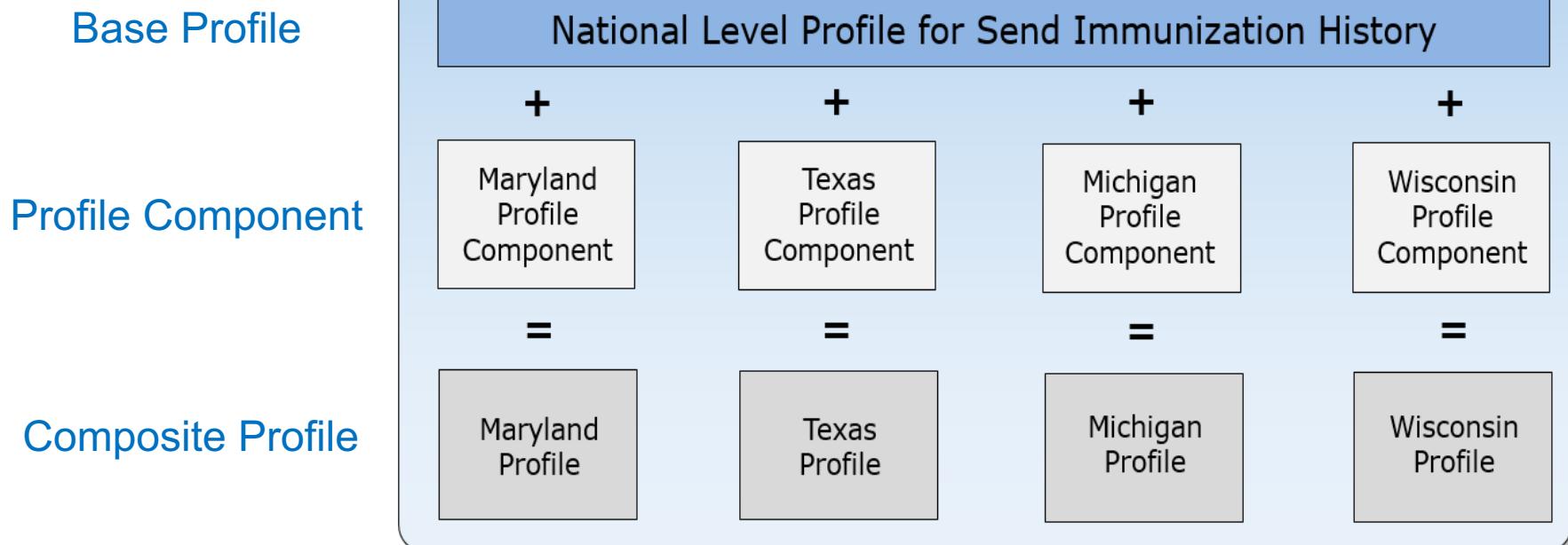
Requirement Substitution



- Specify requirements subset and then construct solution
- Reuse components as “building blocks”

Managing Localizations

- ❑ Profile Components can be used to manage localizations
- ❑ Aids in making comparisons
- ❑ Profiling and validation tools are helpful in profile management and validation



Status

- IGAMT
 - 2 HL7 Balloted IGs Created (May 2017)
 - Many others now using
- TCAMT
 - Used for ONC, ARIA, HIMSS Test Plans
- Testing Tools
 - “Hand-built” Tools
 - Many (General, ONC, ARIA, HIMSS, IHE, etc.)
 - GVT-General Validation Tool Emerging
- Various tool components used for years

What Next?

- Production Quality
- More Features
- HL7 v2 ballot process—initial discussions
 - IGs created with IGAMT
 - Collaborative (on-line)
 - **Context-free test tool is done when IG is done**
- HL7 v2+ moving to on-line standard
 - IGAMT produces IGs in HTML

Thank You!

Questions

Contact: robert.snelick@nist.gov

Tool Portal: hl7v2tools.nist.gov

Extra Slides

NIST HL7 v2 Tool Portfolio

❑ <https://hl7v2tools.nist.gov>

Standard	Owner	Testing Program	Links
Immunization R1.4*	CDC	✓ ONC 2014 Ed. Certification	http://hl7v2-iz-testing.nist.gov
Immunization R1.5*	CDC	✓ ONC 2015 Ed. Certification ✓ AIRA IIS Assessment ✓ HIMSS/CDC EHR Certification	http://hl7v2-iz-r1.5-testing.nist.gov http://iztool-cdc.hit.icsl.net:8080/iztool
Syndromic Surveillance R1.1*	CDC/ISDS	✓ ONC 2014 Ed. Certification	http://hl7v2-ss-testing.nist.gov
Syndromic Surveillance R2.0*	CDC/ISDS	✓ ONC 2015 Ed. Certification	http://hl7v2-ss-r2-testing.nist.gov
LRI R1 DSTU R1	HL7/ONC	✓ ONC 2014 Ed. Certification	http://hl7v2-lab-testing.nist.gov
ELR (Reportable Labs) R1.0*	HL7	✓ ONC 2014/2015 Ed. Certification	http://hl7v2-elr-testing.nist.gov
LOI R1 DSTU R2	HL7/ONC	✓ ONC Pilot Testing	http://hl7v2-loi-r1-testing.nist.gov
LRI R1 DSTU R2	HL7/ONC	✓ ONC Pilot Testing	http://hl7v2-lab-r2-testing.nist.gov
eDOS R2 DSTU R2	HL7/ONC	✓ ONC Pilot Testing	http://hl7v2-edos-r1-testing.nist.gov
Vital Records DR R1	CDC/HL7/IHE	✓ CDC ✓ IHE Connect-a-thon	http://hl7v2-vr-r2-testing.nist.gov
Height and Weight	CDC/IHE	✓ CDC ✓ IHE Connect-a-thon	http://hl7v2-cf-validator.nist.gov
Patient Care Devices (PCD)	IHE	✓ IHE Pre-connect-a-thon ✓ IHE Connect-a-thon	http://ihe-pcd-precon.nist.gov http://ihe-pcd-con.nist.gov
PIX and PDQ	IHE	✓ IHE Pre-connect-a-thon ✓ IHE Connect-a-thon	http://pixpdqtests.nist.gov http://hl7.connectathon-pixpdq.nist.gov/

*State Registries use for on-boarding

✓ Unknown number of local installations

NIST Productivity Tool – IGAMT

IGAMT – Implementation Guide Authoring and Management Tool			
Standard	Developer	Use	HL7 Version
Immunization HL7 R1	CDC	✓ May 2017 HL7 Ballot	HL7 v2.8.2
Immunization R1.5	NIST	✓ NIST Internal for ONC 2015 Ed. Certification	HL7 v2.5.1
Syndromic Surveillance R2.?	CDC/ISDS	✓ In Progress	HL7 v2.5.1
Syndromic Surveillance R2.0	NIST	✓ NIST Internal for ONC 2015 Ed. Certification	HL7 v2.5.1
Vital Records Birth Reporting	CDC	✓ May 2017 HL7 Ballot	HL7 V2.6
LOI R1 DSTU R2	NIST	✓ NIST Internal-In Progress	HL7 v2.5.1
LRI R1 DSTU R2	NIST	✓ NIST Internal-In Progress	HL7 v2.5.1
eDOS R2 DSTU R2	NIST	✓ NIST Internal-In Progress	HL7 v2.5.1
Patient Care Devices (PCD)	NIST	✓ NIST Internal-In Progress for IHE	HL7 v2.6
Electronic Case Reporting	CDC	✓ In Progress	HL7 v2.5.1
Local Use	Vendors/States	✓ Unknown	Unknown

✓ = 50+ registrations (many new coming from the CDC)

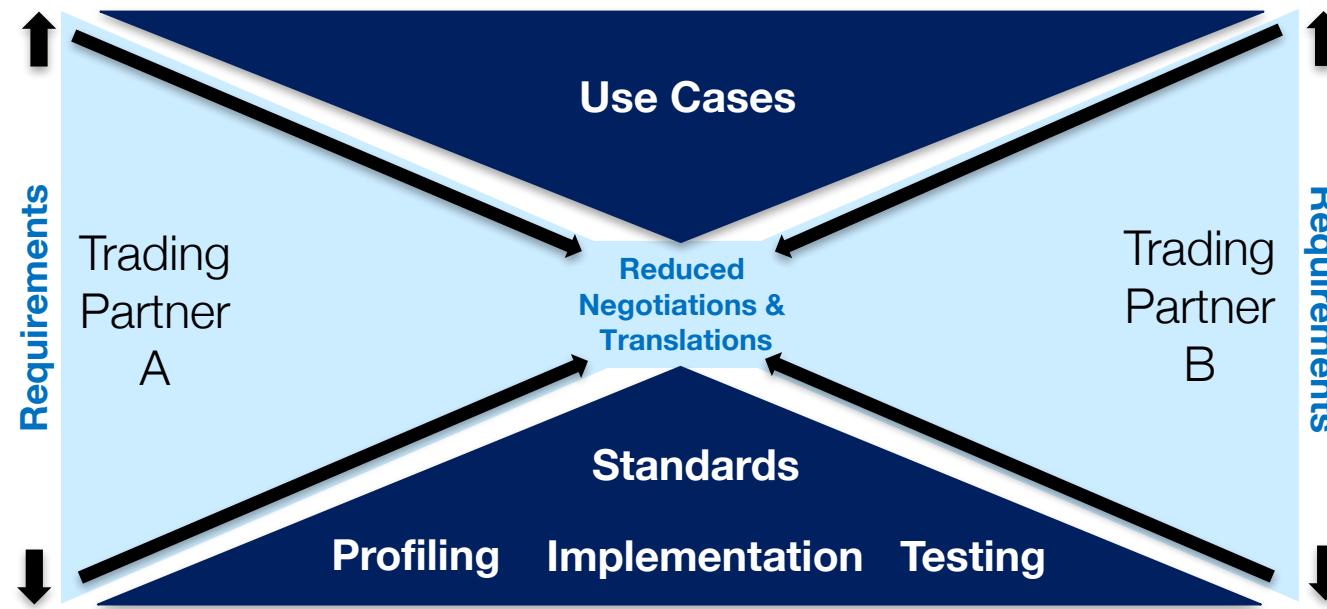
IGAMT-generated implementation guides balloted by HL7

NIST Productivity Tool – TCAMT

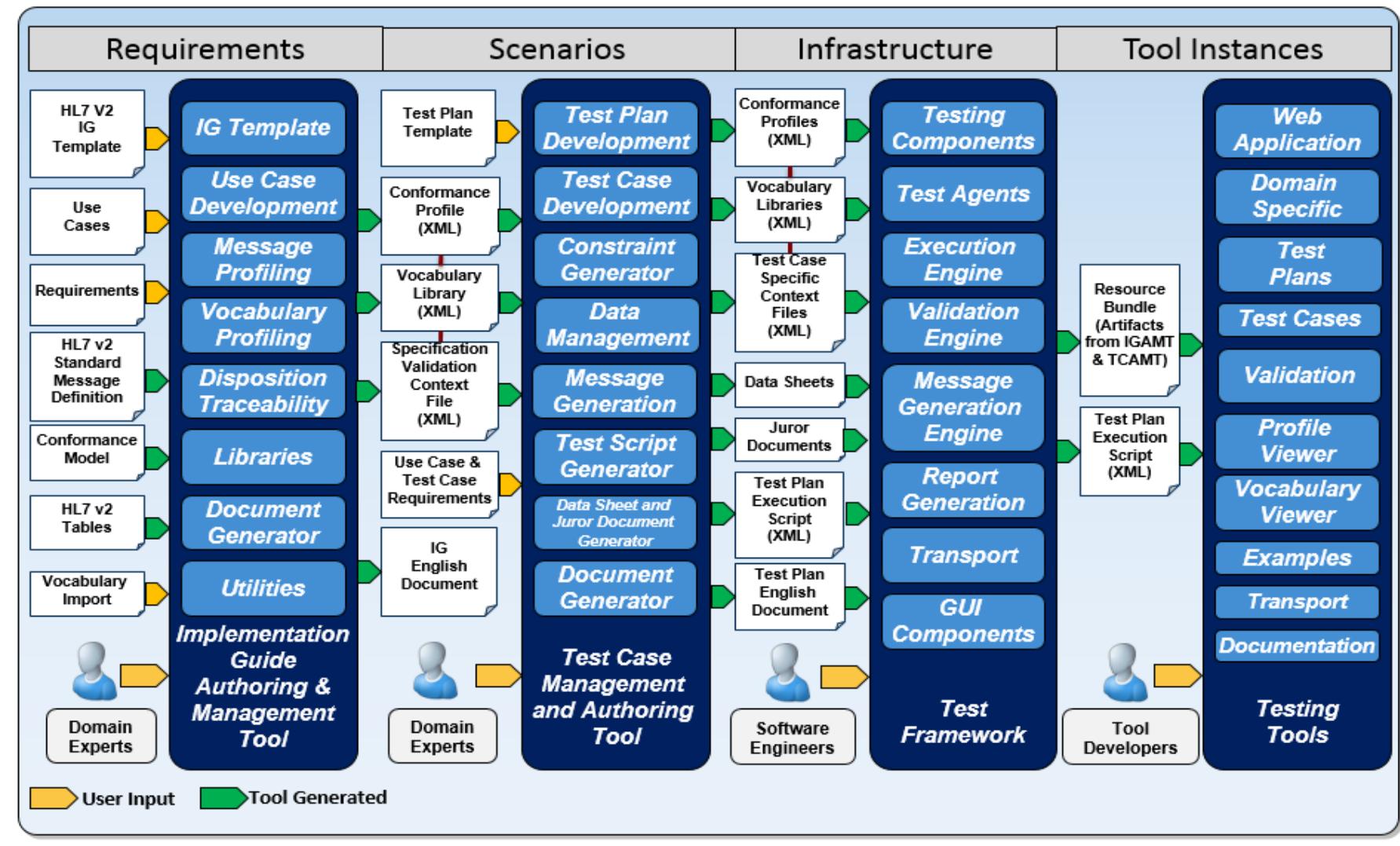
TCAMT – Test Case Authoring and Management Tool		
Standard	Developer	Use
Immunization R1.5	CDC/CNI/HIMSS	✓ HIMSS Certification
Immunization R1.5	CDC/NIST	✓ ONC 2015 Ed. Certification
Immunization R1.5	AIRA	✓ ARIA IIS Assessment Program
Syndromic Surveillance R2.0	ISDS/NIST	✓ ONC 2015 Ed. Certification
Vital Records Death Reporting	CDC/NIST	✓ IHE Pre-connect-a-thon/Connect-a-thon, CDC
Vital Records Birth Reporting	CDC/NIST	✓ IHE Pre-connect-a-thon/Connect-a-thon, CDC – In Planning
LOI R1 DSTU R2	NIST	✓ NIST Internal-In Progress
LRI R1 DSTU R2	NIST	✓ NIST Internal-In Progress
eDOS R2 DSTU R2	NIST	✓ NIST Internal-In Progress
Patient Care Devices (PCD)	NIST	✓ NIST Internal-In Progress for IHE
ePrescribing	NIST/NCPDP	✓ Tool in development (Adapted)

- TCAMT allows domain experts to develop test scenarios and test cases, with example messages—set in the foundation of the XML Profile created in IGAMT.
- Scenarios can be created to test capabilities, workflow, functional requirements, and robustness via “negative” testing.

Towards Interoperability



NIST HL7v2 End-to-End Platform



HL7 v2 XML Profile Format

```

</Structure>
</Field>
- <Field Name="Patient Name" Max="*" Min="1" Usage="R" ItemNo="00108" ConflLength="1" MaxLength="250" MinLength="1" Flavor="XPN_IZ_001" Datatype="XPN">
  - <Structure>
    - <Component Name="Family Name" Usage="R" ConflLength="1" MaxLength="194" MinLength="1" Flavor="FN" Datatype="FN">
      - <Structure>
        <SubComponent Name="Surname" Usage="R" ConflLength="1" MaxLength="50" MinLength="0" Flavor="ST" Datatype="ST"/>
        <SubComponent Name="Own Surname Prefix" Usage="O" ConflLength="1" MaxLength="20" MinLength="0" Flavor="ST" Datatype="ST"/>
        <SubComponent Name="Own Surname" Usage="O" ConflLength="1" MaxLength="50" MinLength="0" Flavor="ST" Datatype="ST"/>
        <SubComponent Name="Surname Prefix From Partner/Spouse" Usage="O" ConflLength="1" MaxLength="20" MinLength="0" Flavor="ST" Datatype="ST"/>
        <SubComponent Name="Surname From Partner/Spouse" Usage="O" ConflLength="1" MaxLength="50" MinLength="0" Flavor="ST" Datatype="ST"/>
      </Structure>
    </Component>
    <Component Name="Given Name" Usage="R" ConflLength="1" MaxLength="30" MinLength="1" Flavor="ST" Datatype="ST"/>
    <Component Name="Second and Further Given Names or Initials Thereof" Usage="RE" ConflLength="1" MaxLength="30" MinLength="1" Flavor="ST" Datatype="ST"/>
    <Component Name="Suffix (e.g., JR or III)" Usage="O" ConflLength="1" MaxLength="20" MinLength="1" Flavor="ST" Datatype="ST"/>
    <Component Name="Prefix (e.g., DR)" Usage="O" ConflLength="1" MaxLength="20" MinLength="1" Flavor="ST" Datatype="ST"/>
    <Component Name="Degree (e.g., MD)" Usage="X" ConflLength="1" MaxLength="6" MinLength="1" Flavor="IS" Datatype="IS" Binding="HL70360"/>
    <Component Name="Name Type Code" Usage="R" ConflLength="1" MaxLength="1" MinLength="1" Flavor="ID" Datatype="ID" Binding="HL70200_IZ"/>
    <Component Name="Name Representation Code" Usage="O" ConflLength="1" MaxLength="1" MinLength="1" Flavor="ID" Datatype="ID" Binding="HL70465"/>
  - <Component Name="Name Context" Usage="O" ConflLength="1" MaxLength="483" MinLength="1" Flavor="CE" Datatype="CE" BindingLocation="1" Binding="HL70448">
    - <Structure>
      <SubComponent Name="Identifier" Usage="O" ConflLength="1" MaxLength="20" MinLength="0" Flavor="ST" Datatype="ST"/>
      <SubComponent Name="Text" Usage="O" ConflLength="1" MaxLength="199" MinLength="0" Flavor="ST" Datatype="ST"/>
      <SubComponent Name="Name of Coding System" Usage="O" ConflLength="1" MaxLength="20" MinLength="0" Flavor="ID" Datatype="ID" Binding="0396"/>
      <SubComponent Name="Alternate Identifier" Usage="O" ConflLength="1" MaxLength="20" MinLength="0" Flavor="ST" Datatype="ST"/>
      <SubComponent Name="Alternate Text" Usage="O" ConflLength="1" MaxLength="199" MinLength="0" Flavor="ST" Datatype="ST"/>
      <SubComponent Name="Name of Alternate Coding System" Usage="O" ConflLength="1" MaxLength="20" MinLength="0" Flavor="ID" Datatype="ID" Binding="0396"/>
    </Structure>
  </Component>
  - <Component Name="Name Validity Range" Usage="X" ConflLength="1" MaxLength="53" MinLength="1" Flavor="DR_IZ_001" Datatype="DR">
    - <Structure>
      <SubComponent Name="Range Start Date/Time" Usage="O" ConflLength="1" MaxLength="26" MinLength="1" Flavor="DTM" Datatype="DTM"/>
      <SubComponent Name="Range End Date/Time" Usage="O" ConflLength="1" MaxLength="26" MinLength="1" Flavor="DTM" Datatype="DTM"/>
    </Structure>
  </Component>
  <Component Name="Name Assembly Order" Usage="O" ConflLength="1" MaxLength="1" MinLength="1" Flavor="ID" Datatype="ID" Binding="HL70444"/>
  - <Component Name="Effective Date" Usage="O" ConflLength="1" MaxLength="26" MinLength="1" Flavor="TS" Datatype="TS">
    - <Structure>
      <SubComponent Name="Time" Usage="R" ConflLength="1" MaxLength="24" MinLength="0" Flavor="DTM" Datatype="DTM"/>
      <SubComponent Name="Degree of Precision" Usage="X" ConflLength="1" MaxLength="1" MinLength="0" Flavor="ID" Datatype="ID" Binding="0529"/>
    </Structure>
  </Component>
</Field>

```