

HL7 EHR – Immunization Functional Profile (IFP) Project

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Introduction

- This is an open project
 - All are welcome!
 - International input invited!
- Team meets Tuesdays at 2PM US ET
 - <https://global.gotomeeting.com/join/597758325>
 - +1 (571) 317-3122 Access Code: 597-758-325
- Next Meeting: 13 February 2018

Immunization Functional Profile Project

Wiki

- Links and documents:
 - Contributors, Contributions and Readiness
 - Reference Materials
 - Functional Models and Profiles
 - Federal Health Information Model (Immunization)
 - Tools
- http://wiki.hl7.org/index.php?title=EHR_Immunization_Functional_Profile

EHR System Functional Model – Release 2

Overarching

OV.1
Overarching

OV.2
Manage User
Help

Care Provision

CP1
Manage Clinical
History

CP2
Render Externally
Sourced Info

CP3
Manage Clinical
Documentation

CP4
Manage Orders

CP5
Manage Results

CP6
Manage Treatment
Administration

CP7
Manage Future Care

CP8
Manage Patient Ed. And
Communication

CP9
Manage Care Coord.
and Reporting

Care Provision Support

CPS1
Record Management

CPS2
Support Externally
Sourced Info

CPS3
Support Clinical
Documentation

CPS4
Support Orders

CPS5
Support Results

CPS6
Support Treatment
Administration

CPS7
Support Future Care

CPS8
Support Patient
Education and
Communication

CPS9
Support Care
Coordination and
Reporting

CPS10
Manage User Help

Administrative Support

AS1
Manage Provider
Information

AS2
Manage Pt
Demographics
Location,
Synchronization

AS3
Manage Personal
Health Record
Interaction

AS4
Manage Communi-
cation

AS5
Manage Clinical
Workflow Tasking

AS6
Manage Resource
Availability

AS7
Support Encounter,
Episode of Care
Mgmt

AS8
Manage Info Access for
Supplemental Use

AS9
Manage Administrative
Transaction
Processing

Population Health Support

Pop1
Health Maint.
Prevention and
Wellness

Pop2
Support Pop Based
Epidemiologic
Investigation

Pop3
Support for Notification
and Response

Pop4
Monitoring Response
Notifications, Patient
Specific

Pop5
Donor Management
Support

Pop6
Measurement,
Analysis, Research &
Reports

Pop7
Public Health Related
Updates

Pop8
Deidentified Data
Request Management

Pop9
Consistent HC
Management of Patient
Groups or Populations

Pop10 Population
Health Study Related
Identifiers

Record Infrastructure

RI1
Record Lifecycle and
Lifespan

RI2
Record Synchronizn

RI3
Record Archive and
Restore

Trust Infrastructure

TI1
Security

TI2
Audit

TI3
Registry and Directory
Services

TI4
Standard Terminology
& Terminology
Services

TI5
Standards-Based
Interoperability

TI6
Business Rules
Management

TI7
Workflow
Management

TI8
Database Backup and
Recovery

TI9
System Management
Operations and
Performance

Focused Functionality = Profile

Whereas the Functional Model (FM) specifies EHR system functions across many domains, a Functional Profile (FP):

- Is based on requirements of a particular domain, region, service/specialty or care setting supported by EHR systems;
- Extends and specializes EHR-S functions and conformance criteria;
- May be tailored to US and/or international realm requirements.
- See Functional Profile List.

Horizontal – EHR-S FM Core Functions

Vertical – Profiles (Built on Base)

Functional Profiles	Ambulatory	Behavioral Health	Child Health	Clinical Research	EHR-S Usability	Emergency Care	Long-Term Care	Laboratory	Meaningful Use	Mobile Health	Nutrition	Pharmacy	Public Health x 9	Immunization	Records Management Evidentiary Support (EHR as Legal Record)	Work/Occupation	and more...
EHR-S FM R2	<u>Care Provision + Care Provision Support</u>					<u>Population Health Support</u>					<u>Administrative Support</u>						
	<u>Record Infrastructure</u> <i>Describes basics of EHR System managing an EHR Record</i> Record Management, Lifespan, Lifecycle, Audit...																
	<u>Trust Infrastructure</u> Identity, Accountability, Authorization, Authentication, Access Control, Audit...																

Collaborative End-to-End Immunization Project

End-to-End

What	Who	How (Tools)
Immunization Functional Profile, based on EHR-S FM R2	HL7 EHR WG	HL7 EHR-S FM/FP Tool
Immunization Use Case(s) <ul style="list-style-type: none"> • User Stories • Scenarios, Events, Actions • Actors and Roles 	HL7 PHER WG IIP Partners? NIST	UCAT(s)
Data Requirements	FHIM/CIMI, PHER, CNI	UCAT, FHIM
Implementation Guides	NIST	IGAMT (NIST)
Software Development	(Vendors, developers)	(various)
Test Cases	NIST, CDC, AEGIS	TCAMT (NIST)
Testing (then Certification)	AEGIS, ICSA	DIL (AEGIS)
Implementation	(Providers, users)	

Immunization Functional Profile Project

Planning and Tasks

Focus	Tasks – Immunization Functional Profile	Who	Status
1. Environmental Scan	Identify Sources: Review, Analysis or Reference <ul style="list-style-type: none"> • Functional Models and Profiles • EHR and PHR System • Conformance Profiles • Domain Analysis Models • FHIM, CIMI Immunization Information Models • Implementation Guides • Use Cases 	All	Complete
2. MU FP 2015 Edition	<ul style="list-style-type: none"> • Review Functions and Criteria in Section §170.315(f)(1), “Transmission to Immunization Registries” and Sections (f)(2) through (f)(7) • Add/modify functions/criteria as needed 	John Roberts Noam Arzt	Complete

Immunization Functional Profile Project

Planning and Tasks

Focus	Tasks – Immunization Functional Profile	Who	Status
3. Use Cases	<p>Identify Sources:</p> <ul style="list-style-type: none">• HL7 Immunization DAM use cases• CDC/CNI/HIMSS/ICSA Immunization Integration Program (IIP) work flows• Work and Health Experts: CDC/NIOSH• Others, as discovered or submitted <p>For each scenario, extract use case scenarios and events, including:</p> <ul style="list-style-type: none">• Event steps, description, actor, roles, inputs, outputs• Follow pattern as per Use Case Scenario Worksheet• Link to EHR-S FM functions and related criteria• Add/modify functions/criteria as needed	Gary Dickinson Julia Chan	Complete

Immunization Functional Profile Project

Planning and Tasks

Focus	Tasks – Immunization Functional Profile	Who	Status
4. EHR-S FM	<p>a) Review Immunization Related Functions, Names, Statements, Descriptions and Conformance Criteria including Sections CP.6.2 and CPS.6.2</p> <p>b) Add/modify functions/criteria as needed</p>	<p>Mark Janczewski MD Julia Chan Gary Dickinson</p>	Scan complete
5. EHR-S FM	<p>a) Review ALL sections, functions and conformance criteria relevant to immunizations</p> <ul style="list-style-type: none"> • CP – Care Provision • CPS – Care Provision Support • AS – Administrative Support • POP – Population Health Support • RI – Record Infrastructure • TI – Trust Infrastructure <p>b) Add/modify functions/criteria as needed</p>		Scan Complete
6. PHR-S FM	<p>• Review Immunization Related Functions and Criteria</p> <p>• Add/modify functions/criteria as needed</p>	John Ritter, HL7 PHR WG	(Future)
7. Data Objects and Elements	<ul style="list-style-type: none"> • Identify Sources: FHIM (CLIM), CIMI, FHIR, HL7 Immunization DAM and IG, IIP • Map IIP Data Requirements to FHIM (CLIM) • Include Record Lifecycle Events in CIMI and CLIM 	Julia Chan Steve Hufnagel	Complete

Immunization Functional Profile Project

Planning and Tasks

Focus	Tasks – Immunization Functional Profile	Who	Status
8. Testing	<ul style="list-style-type: none"> Recommend characteristics of testable criteria 	Mario Hyland David Tao	TBD
9. General Registries	<ul style="list-style-type: none"> Establish functional requirements and common data elements for clinical registries 	CIC WG	Ongoing
10. EA FM/FP Tool	<ul style="list-style-type: none"> Capture selected functions in EHR-S FM/FP Profiling Tool to create initial IFP [EA = Enterprise Architect] 	Anneke Goossen	Complete
11. EA UCAT	<ul style="list-style-type: none"> Capture IDAM/IFP Scenarios in Use Case Authoring Tool (UCAT) 	J.D. Baker	TBD
12. IIP/IDAM in Common	<ul style="list-style-type: none"> Find Commonalties in IDAM Story Boards and IIP Work Flow Scenarios Identify Gaps and Out of Scope Items 	David Tao Craig Newman	Complete
13. Dutch Immunization Program	<ul style="list-style-type: none"> Identify Use Cases, User Stories and Data Requirements 	Anneke Goossen	TBD
14. Work and Health	<ul style="list-style-type: none"> Identify Users Stories and Data Requirements 	Angela Crovetti	Complete
15. Ballot	<ul style="list-style-type: none"> Initiate Ballot Reconcile Ballot Comments 	Team	Underway

Contact

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Related Materials follow

Broad-Based Core Functionality

- Facilitates software-enabled support for individual health and provision of healthcare
- Across care settings: acute, ambulatory, emergent, same day, long-term/post acute, home health...
- Supports both business and clinical domains
 - Describes capture/management of provider business and clinical record
- Enables implementation of policy and best practice
- Specifies functions for safety, security and privacy

EHR-S FM R2

- **Captures core functions/criteria from EHR-S FM R1-based FPs**
- **R2 Record Infrastructure captures RM-ES FP R1**
- **R2 profiled for US Meaningful Use 2011 and 2014**
 - **2015 Edition in development**

Functional Profile Development

The FP Development process:

- Identifies discrete EHR-S FM functions and conformance criteria applicable to that domain (immunization);
- Adds specific EHR system functions and conformance criteria where there are identified gaps

Then, the FP:

- Is balloted by HL7 as a US realm or international standard, either informative or normative;
- After approval by consensus ballot, is published;
 - HL7 IP is free to non-members 90 days post publication;
- May be used as the basis for EHR system conformance claims (by vendors, by provider implementers);
- May be used as the basis for criteria in EHR system certification or inspection programs;
- May be promoted for adoption by ISO.

Profile Development Process

Typical steps, some in parallel:

- Identify lead(s), Include FP veterans
- Scope project, Develop HL7 Project Scope Statement and Get project approval (HL7 EHR WG, SSD SD, TSC)
- Schedule teleconferences, Make announcement
- Gather SME team members, including international folks
- Review previous FP(s)
- Do environmental scan, Find sources and references
- Identify functions/criteria not captured in core EHR-S FM
- Develop FP content
- Learn then use the FM/FP tool, Prepare ballot draft
- Consensus ballot, Reconcile, repeat if needed
- Approve, Publish, Publicize

Tooling Support for FMs and FPs

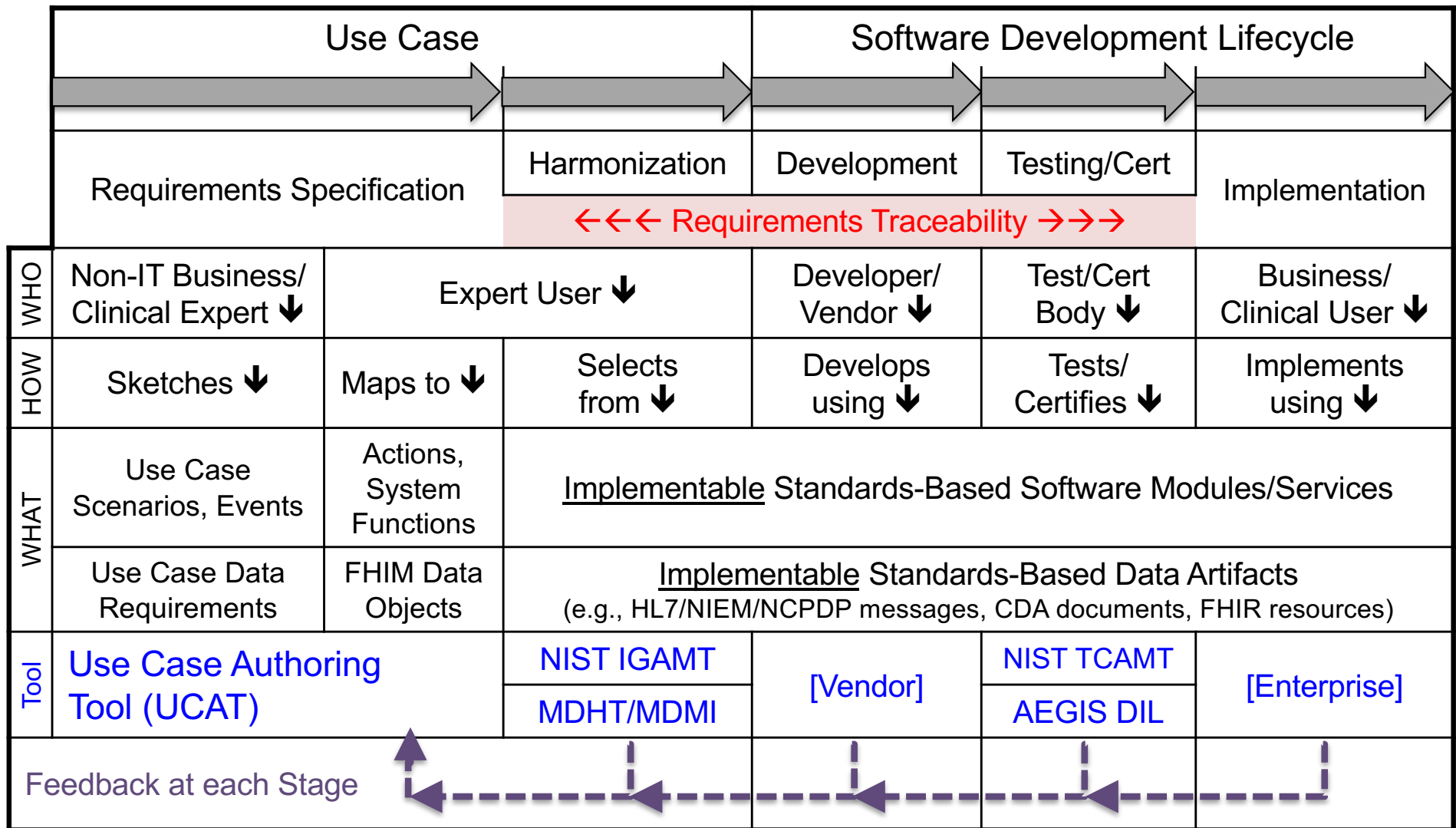
- Based on Sparx Enterprise Architect 10 and up
- Supports EHR-S FM Releases (starting with R2)
 - Develop, ballot, reconcile, publish, maintain
- Supports R2 Functional Profile Development
 - From base FM and from other FPs
 - Develop, ballot, reconcile, publish, maintain
- Supports R2 Language Translation
 - See National Program List
- Next Stage: Capture/manage PHR-S FM R1

Collaborative End-to-End Immunization Project Contributions - Immunization FP Contributions - 29 August 2016

Contributor/Participant	Status	Contribution	Readiness	Individual(s)	Tool
Health Level Seven (HL7) Electronic Health Record (EHR) Work Group	HL7 Sponsor	ISO/HL7 10781 EHR System Functional Model R2	Ready	Brody, Dickinson, Gelzer, Janczewski, Ritter, Warner	HL7 FM/FP Tool (EA), UCAT
		ISO/HL7 16527 PHR System Functional Model R1	Ready		
		HL7 EHR-S Public Health Functional Profiles x 9 Joint w/HL7 Public Health/Emergency Response WG	Ready	John Ritter, Hetty Khan, Michelle Williamson	HL7 FM/FP Tool (EA)
		EHR-S Immunization Functional Profile (IFP)	In Progress	Gary Dickinson Mark Janczewski MD	
		EHR-S FM/FP Developer Tool in Enterprise Architect (EA)	Ready	Anneke Goosen Michael Van Der Zel	
HL7 Public Health/ Emergency Response (PHER) WG	Interested	Immunization Domain Analysis Model (IDAM) • Story Boards, Use Case Scenarios, Events, Actions, Actors/Roles, Data Requirements	Ready	John Roberts	
		Immunization History Conformance Profile	Ready		
HL7 Clinical Information Modeling Initiative (CIMI) WG	Confirmed	CIMI Immunization Clinical Model(s)	Ready?	Galen Mulrooney Steve Hufnagel	
AEGIS (HL7 Testing Partner)	Confirmed	Immunization Test Cases	Ready	Mario Hyland	AEGIS DIL
		Developers Integration Lab (DIL)	Ready	Matthew Gereke	
US Office of National Coordinator	Observer	Standards & Interoperability (S&I) Framework • Use Case Methodology	Ready	Steve Posnack	
		S&I Use Case Requirements Template	Ready		UCAT, MS Word
Federal Health Information Model (FHIM)	Confirmed	FHIM Immunization Model(s) • Immunization Data Requirements	Ready	Galen Mulrooney	FHIM Tool
S&I Simplification WG	Confirmed	S&I Simplification Core Matrix v3.4	Ready	Gary Dickinson	UCAT, MS Excel
		Use Case Exchange Format	Ready	Steve Hufnagel Ed Larsen	UCAT → UCAT, → NIST, → USHIK
National Institute for Standards and Technology (NIST)	Confirmed	Immunization Test Cases	Ready	Kevin Brady Rob Snelick	NIST IZ Tool
		Implementation Guide Authoring & Management Tool	Ready		NIST IGAMT
		Test Case Authoring & Management Tool	Ready		NIST TCAMT
Results4Care	Confirmed	Detailed Clinical Models (DCMs) for Immunization	Ready	William Goosen	
Sparx Systems	Confirmed	EA-based Use Case Authoring Tool (UCAT)	Ready	J.D. Baker	UCAT (EA)
Prometheus	Observer	Beacon Use Case Authoring Tool (UCAT)	Ready	Art Greisser	UCAT (Beacon)
US Agency for Health Research and Quality (AHRQ)	Invited	US Health Information Knowledgebase (USHIK)	Ready	Matthew Chudy Chuck Penozza	USHIK Tool
US Centers for Disease Control and Prevention (CDC) Immunization Team	Observer	Immunization Integration Program (IIP) Immunization Test Cases	Ready	Craig Newman	
Chickasaw Nation Industries (CNI)	Interested	Immunization Integration Program (IIP) • Use Case Scenarios, Work Flows • Immunization Data Requirements	Ready	Floyd Eisenberg MD	NIST IZ Tool
HIMSS	Invited			Joyce Sensmeier	NIST TCAMT
ICSA Labs (HIMSS Testing Partner)	Interested			David Tao Michelle Knighton	

Reference – S&I Simplification

From Sketch to Implementation



Looking Forward

EHR-S FM on FHIR!

- HL7 FHIR = Fast Health Interoperable Resources
 - New, widely-promoted, HL7 “Standard”
 - Built on current Web and mobile app technologies
 - Addition (or ultimate successor?) to HL7 Version 2/3 messages, HL7 CDA/CCDA documents
 - Balloted/published as HL7 Standard for Trial Use, 3rd Edition, Mar 2017
 - FHIR Resources are data containers (objects), with elements
 - FHIR Resource instances may be:
 - Transient (single exchange only)
 - Persistent (native) data objects in source (or any) system
 - For exchange, FHIR Resource instances may be:
 - Queried then *pulled* from source system: e.g., via RESTFUL APIs
 - At trigger events, *pushed* to receiver system
- Objective: To show how EHR-S FM R2 requirements are fulfilled in FHIR implementation(s)
- Starting with R2 Record Infrastructure

Req'ts Fulfilled in Implementation

EHR-S FM/FP specifies ↓		FHIR specifies ↓
Functional + Data Requirements	Fulfilled in →	Implementable Resources
EHR Record Management: <ul style="list-style-type: none"> • Record Entries – Lifespan, Lifecycle Events • Tracking Who did What When Where and Why 	Fulfilled in →	FHIR <u>AuditEvent</u> + <u>Provenance</u> Resources, starting with Record Entry origination/retention (initial lifecycle event) http://hl7.org/fhir/2016Sep/ehrsle/ehrsle.html
<ul style="list-style-type: none"> • Immunization FP • Long Term Care FP • Behavioral Health FP • Other FPs 	Fulfilled in →	Relevant FHIR Resources such as: <u>Assessment</u> , <u>CarePlan</u> , <u>DiagnosticOrder</u> , <u>Goal</u> , <u>Immunization</u> , <u>ImmunizationRecommendation</u> , <u>Observation</u> , <u>ReferralRequest</u> ...