TSC Presentation

EHR System Function and Information Model (EHR-S FIM) Release 3.0 Preparation

(ISO/HL7 10781 r3:2017 EHR-S FIM)

Co-Chairs: Gary Dickinson, Don Mon, Helen Stevens Love, Mark Janczewski, John Ritter, Patricia Van Dyke

Facilitator: Steve Hufnagel

January 14, 2014 DRAFT-C
The EHR Interoperability WG current focus is on the ‘2017 EHR-S FIM Release-3 roadmap to make EHR-S FM r2 clear, complete, concise, correct, consistent, traceable, easy-to-use functions and conformance criteria using HL7 Service Aware Interoperability Framework (SAIF), HL7 Fast Healthcare Interoperability Resources (FHIR), US-realm Federal Health Information Model (FHIM) and Meaningful Use criteria (MU2) and other, as needed, SAIF Implementation Guide artifacts within an UML-tool based knowledge and expert-system platform; where, analysts and implementers can efficiently profile domain, realm and enterprise EHR functional use-cases, conformance-criteria scenarios and information-exchange interoperability Specifications for message, document and services’ exchange-architecture implementations, tests and certifications.
Key Features
ISO/HL7 10781 r3:2017 EHR-S FIM

EHR-S FIM R-3 UML tool-based knowledge-and-expert system-platform

1. Make r2 clear, complete, concise, correct, consistent, traceable, easy-to-use
2. Use HL7 Service Aware Interoperability Framework (SAIF),
3. Include, as needed, SAIF Implementation Guide (SAIF IG) artifacts
   - Include HL7 Fast Healthcare Interoperability Resources (FHIR),
   - Include US-realm Federal Health Information Model (FHIM)
   - Include US-realm Meaningful Use Stage-2 (MU2) criteria
4. Where, users can efficiently profile domain, realm and enterprise
   - EHR functional use-cases, their conformance-criteria scenarios linked-to
     information-exchange interoperability-Specifications for message, document and services’ exchange-architecture implementations, tests and certifications.
APPROACH: Exchange Architecture Specifications including:

– Domain Analysis Models and RIM integration
– implementation-paradigm profile-additions
  • V2, V3 and CDA messages and documents,
  • FHIR, web-services, interface behavioral-specifications and
  • realm-specific data-models with terminology-bindings

PRODUCT: User-Customizable EA tool populated with HL7 Products, capable of

• Being adapted and extended to specific domains, realms and enterprises.
• generating fully-qualified semantically-interoperable HL7-SAIF exchange-architectures of system Information-Exchanges (IEs) and implementable, testable and certifiable Interoperability-Specifications (ISs).
1. **EHR-S FIM R3 be the HL7 Unification Umbrella**
   - Management of EHR Interoperability Complexity
   - Organization of domains, realm and enterprise specializations
   - HL7 SAIF Implementation Guides
   - HL7 Conformance Project
   - Release 3 built within overarching (SAIF) framework to ensure use case functionality, data and information traceability.

2. **EHR “Product-Line” Framework** within the FIM Umbrella
   - Such as EHR-S, PHR-S, LIS, Imaging, Pharmacy
   - Led by other workgroups, such as OO Lab

3. **HL7 Governance harmonize components within Framework**
   - FHA FHIM define HL7 US-Realm FHIR-profile
   - EHR-S FIM EA-Platform be foundation of HL7 Conformance Test Project
   - Sparx EA be the delivery platform to provide HL7 Requirements-Specifications to Users/Implementers
Benefit of HL7 Product-Line Unification Around ‘2017 EHR-S FIM Release-3

1. Users can start with EHR-S FIM use-cases and scenarios

2. EHR-S FIM R3 provides SAIF IG clinical context and requirements

3. EHR-S FIM functions can be linked to specific domain, realm and enterprise Information Exchange (IE) Interoperability Specifications (ISs)

4. FHIR provides baseline for implementation paradigm profiles

5. EHR-S FIM FHIR-profiles can be domain, realm and enterprise specific

6. Example: FHA FHIM can be adapted to-be the US Realm FHIR Profile.

7. Other implementation paradigms for message, service and document.

8. SAIF Implementation guides, can be generated, tested and certified.

9. Sparx EA becomes HL7 Knowledge-Base platform
Thank you for your help and Consideration!

EHR WG Co-chairs

- Gary Dickinson, CentriHealth, USA 951-536-7010, gary.dickinson@ehr-standards.com
- Donald Mon PhD, RTI International, USA 312-777-5228, DonMon@rti.org
- Helen Stevens Love MBA, HL7 Canada, CAN +1 250-598-0312, helen.stevens@shaw.ca
- Mark Janczewski MD, MPH, Medical Networks, LLC, USA +1 703-994-7637, mark.janczewski@verizon.net
- John Ritter, USA +1 412-372-5783, johnritter1@verizon.net
- Patricia Van Dyke, Delta Dental, USA +1 503-243-4492, patricia.vandyke@modahealth.com

2013 Immunization Management Prototype is at
PSS #688: EHR-S FIM R3 Approach

1. Add **Conceptual Information Model & Logical Data Model** to EHR-S Functions

2. Demonstrate **SAIF methodology** to Populate Interoperability Specification with HL7 artifacts and EHR System Function and Information Model (EHR-S FIM)

3. Incorporate **S&I Framework simplification methodology**
   - EHR-S function descriptions correspond to Use Case (UC) scenarios events.
     - New scenarios composed from common actors, actions/activities and their inputs & outputs
     - EHR-S FM should list inputs and outputs to functions (e.g. standard IO nouns and verbs)

4. UC simplification implies that EHR-S FM should **harmonize & manage**:
   - Common actors/entities/concepts, their definitions, their data elements
   - Common Actions/Activities and their input and output entities.
   - Common requirements.
   - Domain specific profile context defined by assertions

5. Maintain **domain profile traceability** as HL7 Work Groups (WGs) define
   - Domain Analysis Models (DAMS), Domain Information Models (DIMS),
   - Detailed Clinical Models (DCLs), etc.
Demonstrate Information Model approach. For each EHR-S FM Function:

- “Sequence” of actions/activities which may have information exchanges (inputs and outputs)
- Assertions (e.g., requirements predicates)
- Requirements (aka conformance criteria)
- Business Rules
- Conceptual Information Model based on function statement, description & criteria
- Logical Data Model

**ISSUE:** As this becomes a standard, what should be the basis to define the data elements for each logical data module/class or should we NOT define the data elements?

- HL7 RIM, DAMS, DIMS, DCLs, etc.
- US Federal Heath Information Model (FHIM)
- Other information models (Canada, New Zealand, GB, Singapore)

- Dependencies among functions (“see also”)
- Assertions and Common Actors, Actions, Data Element Set, data dictionary (UC Simplification)
- Service, Message or Document Profiles: content & transport interoperable standards-specifications
**Notional Set of HL7 Artifacts within an Enterprise Compliance and Conformance Framework (ECCF)**

<table>
<thead>
<tr>
<th>ECCF</th>
<th>Enterprise Dimension</th>
<th>Information Dimension</th>
<th>Computational Dimension</th>
<th>Engineering Dimension</th>
<th>Technical Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Business</td>
<td>✓ Inventory of</td>
<td>✓ Inventory of</td>
<td>✓ Inventory of</td>
<td>✓ Inventory of</td>
<td>✓ Inventory of</td>
</tr>
<tr>
<td>✓ Policies, Procedures</td>
<td>✓ Information Requirements</td>
<td>✓ Accountability, Roles, Functional Requirements, Profiles, Behaviors, Interactions</td>
<td>✓ Key Performance Parameters</td>
<td>✓ Technical Requirements</td>
<td></td>
</tr>
<tr>
<td>✓ Business Policies, Governance, Implementation Guides, Design Constraints, Organization Contracts</td>
<td>✓ Information Models</td>
<td>✓ Specifications</td>
<td>✓ Models, Capabilities, Features and Versions for</td>
<td>✓ Models, Capabilities, Features and Versions for</td>
<td></td>
</tr>
<tr>
<td>✓ Business Nodes, Business Rules, Business Procedures, Business Workflows, Technology Specific Standards</td>
<td>✓ Domain IM</td>
<td>✓ Scenario Events, Use Cases, Workflow Use Cases, Components, Interfaces</td>
<td>✓ SW Environments, SW Capabilities, SW Libraries, SW Services, SW Transports</td>
<td>✓ HW Platforms, HW Environments, Network Devices, Communication Devices</td>
<td></td>
</tr>
</tbody>
</table>

**Logical Perspective**

- Business Policies
- Governance
- Implementation Guides
- Design Constraints
- Organization Contracts

**Implementable Perspective**

- Business Nodes
- Business Rules
- Business Procedures
- Business Workflows
- Technology Specific Standards

- Schemas for
  - Databases
  - Messages
  - Documents
  - Services
  - Transformations

- Automation Units
- Technical Interfaces
- Technical Operations
- Orchestration Scripts

- SW Specifications for
  - Applications
  - GUIs
  - Components
  - SW Deployments

- SW Specifications for
  - SW Transports

- HW Deployment Specifications
- HW Execution Context
- HW Application Bindings
- HW Deployment Topology
- HW Platform Bindings

**Responsibility:** HL7 | EHR-S FIM | Projects | Development Organization
2013 EHR-S & PHR-S Reference Concept-of-Operation
2013 EHR-S & PHR-S Reference Activity Model

Business-context, given within system-function conformance criteria, constrain manage Record-Entry types "according to scope-of-practice, organizational policy jurisdictional law, patient preference-or-consent."
Business-context, given within system-function conformance criteria, constrain manage Record-Entry types "according to scope-of-practice, organizational policy jurisdictional law, patient preference-or-consent."
Business-context, given within system-function conformance criteria, constrain manage Record-Entry types "according to scope-of-practice, organizational policy jurisdictional law, patient preference-or-consent."
Release-3 CP.6.2#01 During an encounter, the system SHALL capture, maintain and render Immunization Administration including Immunization Administration (dose, date and time) and Medication (name, type, strength, manufacturer, lot number) as Discrete Data.
2013 EXAMPLE: CP.6.2 Immunization Management Conceptual Information Model
2013 Prototype Conclusions

- EHR-S FIM can populate portions of SAIF for HL7 WGs
  - Information and Computational Dimensions
  - Conceptual and Logical Perspectives
- EHR-S FIM can be composed into higher level capabilities by functional analysts and system engineers
  - Encourage reuse
  - Avoid duplication
- EHR-S FM can be the basis for Interoperability Specifications
  - Messages, Documents, Services
  - FHIR domain, realm, and enterprise profiles
- Using Sparx EA as HL7 EHR-S FIM Requirements-Specifications platform can support HL7 Conformance Test and Certification Project