Monthly Summary Briefing

HL7 EHR Work Group (EHR-WG)

by Stephen Hufnagel, Tiag subcontractor
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November 23, 2013 **Frequently-Updated Working-Draft**

http://wiki.hl7.org/index.php?title=EHR_Interoperability_WG

VA HEALTH CARE Defining EXCELLENCE in the 21st Century

Contents
FY2014Q1-Prototype Report
EHR-S FIM Release-3:2016 Preparation

The complete-and-current HL7 EHR-System Function-and-Information Model Release-3 Development-Summary Presentation, dated November-2013 is available at **http://wiki.hl7.org/index.php?title=EHR_Interoperability_WG**

EHR Work Group Goal & Objectives

- Electronic Health Record (EHR) Work Group's **goal** is to support the HL7 mission of developing standards for EHR data, information, functionality, and interoperability.
  - Functional and Information Requirements for Electronic Health Records (EHR) and systems (EHRS),
  - Functional and Information Requirements for Personal Health Records (PHR) and systems (PHRS),
- EHR Interoperability WG's **objectives are**
  1. to create a clear, complete, concise, correct and consistent EHR-S FIM r3.0 in the Sparx Systems Enterprise Architect (EA) tool; where, it addresses the issues identified by the VA negative r2.0 ballot.
  2. to produce a Meaningful Use profile for r2.0.
- Resource Management Evidentiary Support (RM-ES) project's **objective** is to provide expertise on records management, compliance, and data/record integrity and governance to support the use of medical records for clinical care and decision-making, business, legal and disclosure purposes.
- EHR Usability WG's **objective** is developing a usability profile for the EHR-S FM
- PHR-S WG's **objective** is to maintain a Patient Healthcare System Functional Model (PHR-S FM).

NOTE: EHR-S FIM is NOT intended to imply a specific implementation architecture-or-workflow!

EHR WG

Schedule: http://www.hl7.org/concalls/default.aspx
List Server: http://www.hl7.org/myhl7/managelistservs.cfm

Health Level Seven – Electronic Health Record Work Group
Weekly Teleconference Schedule
Revised: 20 November 2013

Day	Time US ET	Activity	Lead(s)	Dial-In	Screen Sharing	List Server (for agendas, announcements)
Mon	1200	Records Management/ Evidentiary Support	Warner, Gelzer	1-877-668-4493 Code 927 002 088#	Link	EHR Legal
Tues	1300	EHRS FM Release 3 Planning	Hufnagel, Dickinson	1-770-657-9270, Passcode 510269#	Link	EHR Interop
	1400	Meaningful Use Functional Profile	Datta, Dickinson	1-770-657-9270, Passcode 510269#	Link	EHR Interop
	1500	FULL EHR WG	Co-Chairs	1-770-657-9270, Passcode 510269#	Link	EHR WG
Wed	1200	Personal Health Record WG	Ritter, Dickinson, Doo	1-770-657-9270, Passcode 510269#	TBA	EHR PHR
	1300	EHR System Usability WG	Mon, Ritter, Rocca, Gartner	1-770-657-9270, Passcode 510269#	Link	EHR Usability
Thur	Open					
Fri	0930	EHR WG Co-Chairs	Co-Chairs	1-770-657-9270, Passcode 510269#	TBA	N/A

EHR-S FIM Acronyms

- **aka** also known as
- **CC** EHR-S FIM Conformance Criteria
- **CDA** **Clinical Document Architecture**
- **DD** Data Dictionary
- **CIM** Conceptual Information Model
- **CP** Care Provision
- **CPS** Care Provisioning Support
- **EA** Enterprise Architect
- **EHR-S** EHR System
- **EHR-S FIM** EHR-S Function and Information Model
- **FHA** US Federal Health Architecture
- **FHIM** US Federal Health Information Model
- **FHIR** Fast Healthcare Interoperability Resources
- **FIM** EHR-S Function and Information Model
- **FIM(MU)** EHR-S FIM profile for MU
- **FM** Function Model
- **FY** Fiscal Year
- **IM** Information Model
- **MDHT** Model Driven Health Tools
- **MU** US Meaningful Use objectives-and-criteria
- **ONC** US Office of the National-Coordinator
- **OHT** Open Health Tools
- **POA&M** Plan of Actions and Milestones
- **R 2/3** Release 2 or 3
- **RI** Resource Infrastructure
- **RIM** HL7 Reference Information Model
- **S&I** ONC Standards & Interoperability Framework
- **WBS** Work Breakdown Structure
- **WG** Work Group

Executive Summary
EHR-S FIM r3:2016 Preparation

This executive-summary specifically addresses potential work-group impacts and/or trends, which are important for VA, IPO and DOD awareness.

EHR System Function-and-Information Model (EHR-S FIM)

- **Structured, based-on a fully-specified Reference Model (RM) for**
  - Clear, complete, concise, correct, consistent and intuitive ease-of-use;
  - Sparx Enterprise Architect (EA) UML-model tool-based; where, release 3 (r3)
    - manages user-activities, system-functions. business-rules, interoperable-data separately; and,
    - Consistent-global Conformance Criteria (CCs) replace ad-hoc-local r2 CCs
    - Single Infrastructure-section contains previously-separate r2 Record-and-Trust Infrastructure-sections
- **EA Tool-generated Interoperability-Specifications based-on Use-Cases**
  - Use-Cases come-from HITSP & S&I Framework Use-Case Simplification work linked-to
  - Requirements, which come-from EHR-S r2.0 Functions' and their restructured CCs linked-to
  - International Interoperability-Specifications based-on HL7 FHIR (Fast Healthcare Interoperability Resources)
  - US-Realm Interoperability-Specifications based-on FHA FHIM (Federal Health Information Model)

NOTE: EHR-S FIM is NOT intended to imply a specific architecture or workflow!

Executive Summary
Conclusions and Recommendations
EHR-S FIM r3:2016 Preparation

1. EHR-S FIM vision is to become the *"Easy Button" for EHR Interoperability Specifications*
   a. Easily-customizable to user-specific profiles.
   b. Including a US-Realm Meaningful Use (MU) & FHIM profile
   c. EHR-S FIM r3:2016 within Sparx EA represents a powerful HL7 product; where,
      i. EA integrates FHIR, FHIM and S&I Framework's Use-Case Simplification, and
      ii. The EA tool-based EHR-S FIM is Governed and Configuration Managed consistently.
      iii. The EA tool can generate both a navigable-web-site and printable-report
      iv. Support user-specific profiles (e.g., WG project DAMs, DIMs, DCMs).
2. HL7.org/EHRSFIM web-site should be setup-and-managed by the EHR Interoperability WG
   a. Supporting peer review, trial-use and stakeholder-contribution during FY14- Alpha & FY15-Beta development.
3. EHR-S FIM development, tooling and balloting resources = (estimated) 5-FTE Man-years
   a. A marketing campaign is needed to justify EHR-S FIM r3:2016 resources

Plan of Actions and Milestones
FY2014Q1 POA&M
EHR-S FIM Release-3:2016 Preparation

October 2013 (Identify processes, tools and issues/risks) **Completed**

- Prototype CP.6.2 Immunization Management 22-Oct-13
- Prototype RI.1.1.1 Originate and Retain Record Entry 29-Oct-13

November 2013 (Prototype complete process-and-products)

- Prototype FHIR integration (Allergies, Intolerance & Adverse Reaction) 5-Nov-13
- Prototype FHIM integration (Allergies, Intolerance & Adverse Reaction) 8-Nov-13
- Define EHR-S Reference-Model and Conceptual-Architecture 15-Nov-13
- Prototype Use-Case generation of Immunization Interoperability-Specification in-progress
- Harmonize with ISO/EN 13940 Continuity-of-Care System-of-Concepts pending
- Harmonize with Electronic Health Record Communication (ISO/EN 13606)
- Prototype EHR-S FIM Ballot Production process-and-products for prototype

December 2013 (Develop production WBS and POA&M)

- Create Release 3 Work-Break-Down Structure (WBS) & POA&M
- Setup EA tool with finalized Release 2, after ISO ballot reconciliation

January 2014 – 2016 (Approve & Execute Plan)

- Jan 2013: Present Prototype, WBS & POA&M at HL7 WG meeting; then, execute POA&M.
- Establish public www.EHR-S-FIM.org website to get broad peer-review

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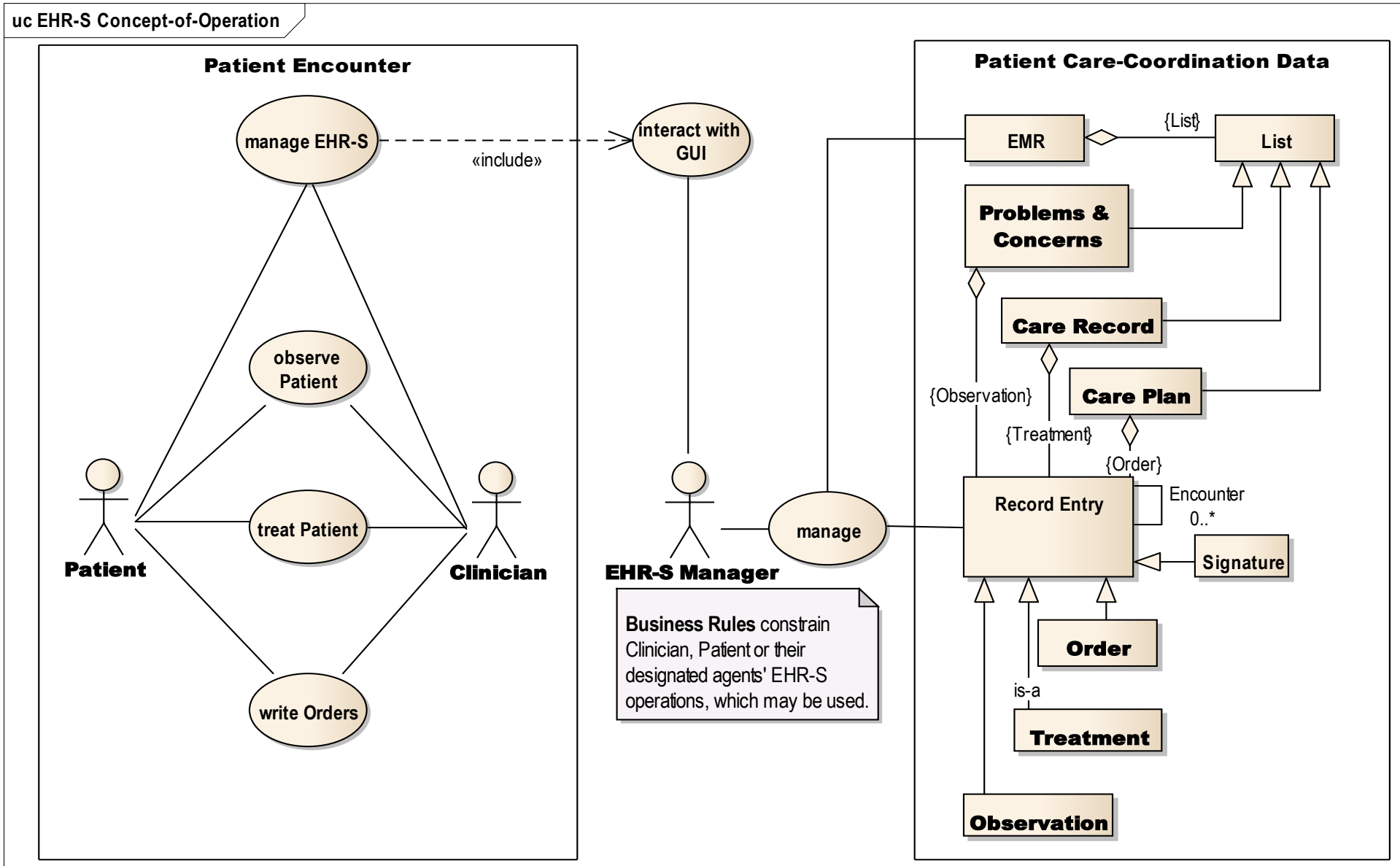
Concept-of-Operations Scenario
EHR-S FIM Release-3:2016 Preparation

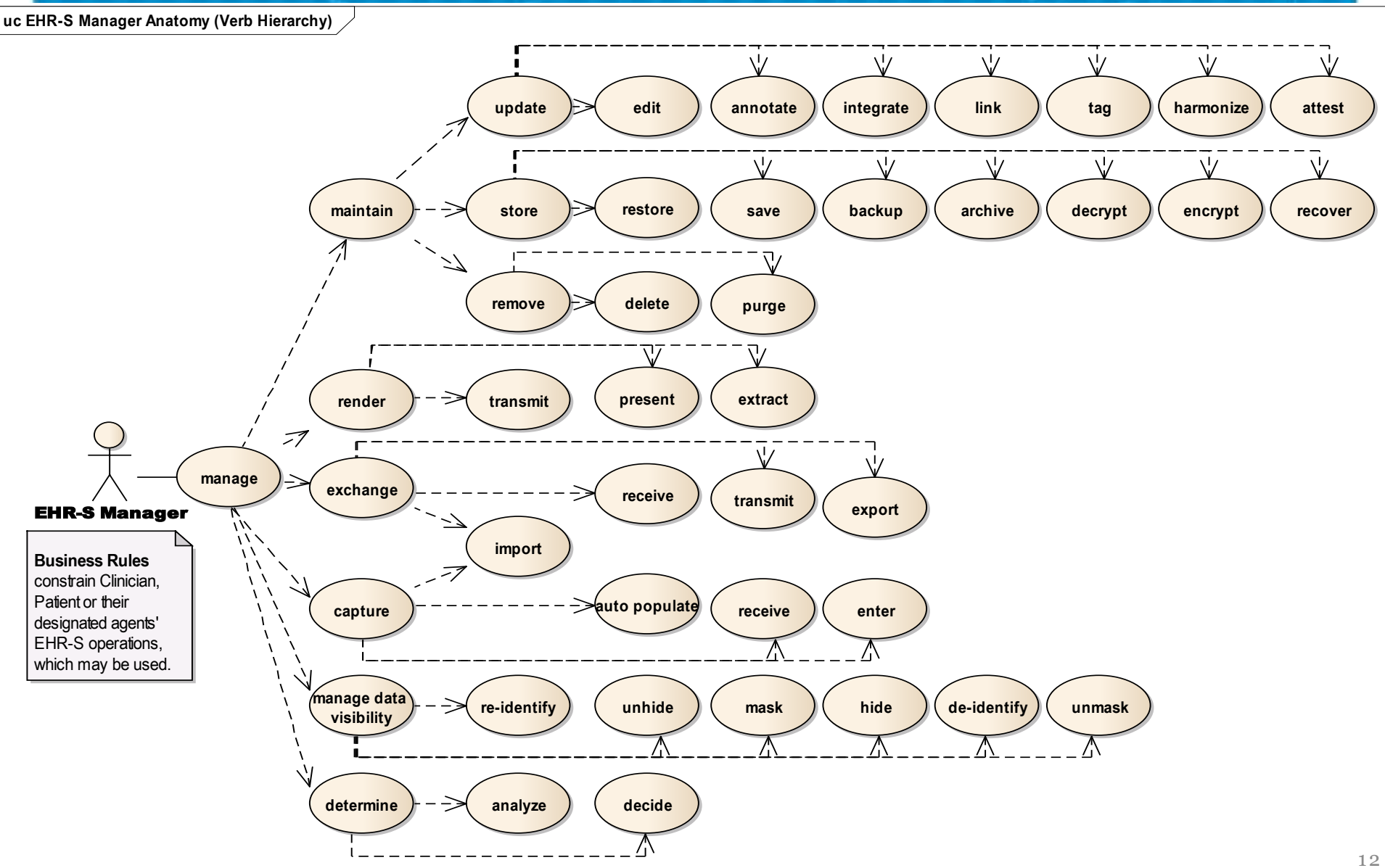
A Clinician and Patient and/or their designated Agents have Encounters; where, they may *use* EHR-S (EHR System) GUI (Graphical-User-Interface) to *manage* Data, in accordance with scope-of-practice, organizational-policy, jurisdictional-law, and patient-preferences:

- The Clinician *reviews* the Patient's EMR (Electronic Medical Record) and related Information
- The Clinician *observes, treats, writes-orders and documents* the Patient-Encounter
- The Patient *provides* requested-Information and is *provided* educational-Information
- The EHR-S Manager *manages*
  - Record Entries for Orders, Treatments and Observations
  - EMR Care-Plans, Care-Records, and Problems-and-Concerns, which are organized from the Record-Entries.
  - Encounters, which are signed by the Clinician (s) and possibly the Patient.

Concept of Operations Model
EHR-S FIM Release-3:2016 Preparation



Manager Operations aka Verb Hierarchy EHR-S FIM Release-3:2016 Preparation



Reference Model Definition
EHR-S FIM Release-3:2016 Preparation

The EHR-S reference model (RM) is an abstract-framework for structuring significant-relationships among the entities of EHR-S environments based-on consistent EHR-S function-and-information conceptual models; where, EHR-S RM conformance criteria contain a constrained-lexicon of nouns (entities), verbs (operations/tasks), qualifiers (conditions), constraints (policies/rules), which may be used-as requirements-specifications by analysts, developers, implementers, and testers. The EHR-S or PHR-S RM-instance-models provide a common syntax-and-semantics that can be used unambiguously across-and-between different implementations; where, the RM instances may be linked-to specific-implementation standards-technologies-paradigms-or-patterns. [based-on OASIS RM definition]

- According to the Organization for the Advancement of Structured Information Standards (**OASIS**) a reference model is "an abstract framework for understanding significant relationships among the entities of some environment, and for the development of consistent standards or specifications supporting that environment. A reference model is based on a small number of unifying concepts and may be used as a basis for education and explaining standards to a non-specialist. A reference model is not directly tied to any standards, technologies or other concrete implementation details, but it does seek to provide a common semantics that can be used unambiguously across and between different implementations."

EHR-S RM Conformance-Criteria Definition EHR-S FIM Release-3:2016 Preparation

- **Human**
  - Clinician, Patient, Designated Agent
- **Human Action**
  - Linked-to Use-Case Actions
  - CLINICIAN: Observe, Treat, Write-Orders
  - such as Immunization Administration
- **System**
  - EHR or PHR
- **Applicability (SHALL, SHOULD or MAY)**
  - according to
    - Scope of practice,
    - Organizational policy,
    - Jurisdictional law,
    - Patient preference or consent."
- **System Function Constraints**
  - Invariant-conditions (e.g., context)
  - Pre-conditions (e.g., triggers)
  - Post- conditions (e.g., goal, outcomes)
- **System Function Type**
  - System provides the ability (for a human) to
  - Or the system directly does
- **System Function**
  - EHR Verb Hierarchy of what the system does, such as manage, maintain, …
- **Data Requirements**
  - Linked-to International FHIR specifications
  - Linked-to US Realm FHIM specifications
- **Associations & Dependencies**
  - Supporting capabilities and functions

EHR-S RM
Example Conformance-Criteria
EHR-S FIM Release-3:2016 Preparation

CP.6.2#01 During an Encounter, the EHR system SHALL provide the ability to *capture* Immunization Administration details as discrete data, such as Immunization FHIR (Fast Healthcare Interoperability Resource); where, the Immunization data may be associated with the following resources:

- AdverseReaction and other Observations;
- Patient , Practitioner, Organization, Location

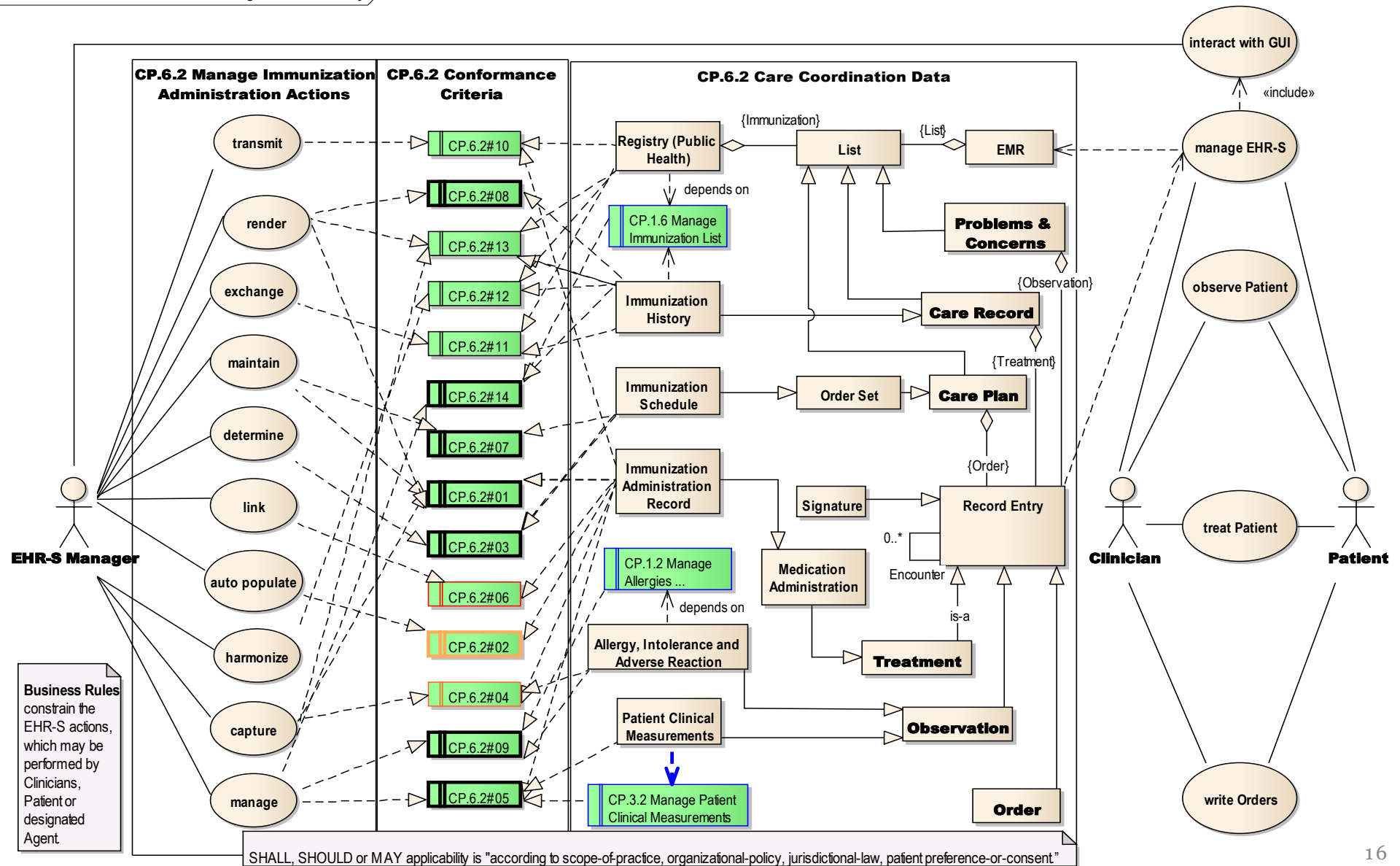
And, within the US Realm, the Immunization and associated resources are express-able by the applicable FHIM (Federal Health Information Model) Domains of:

- Immunization, Adverse Reaction, Allergy and Intolerance
- Associated with appropriate FHIM classes (e.g., Person, …)

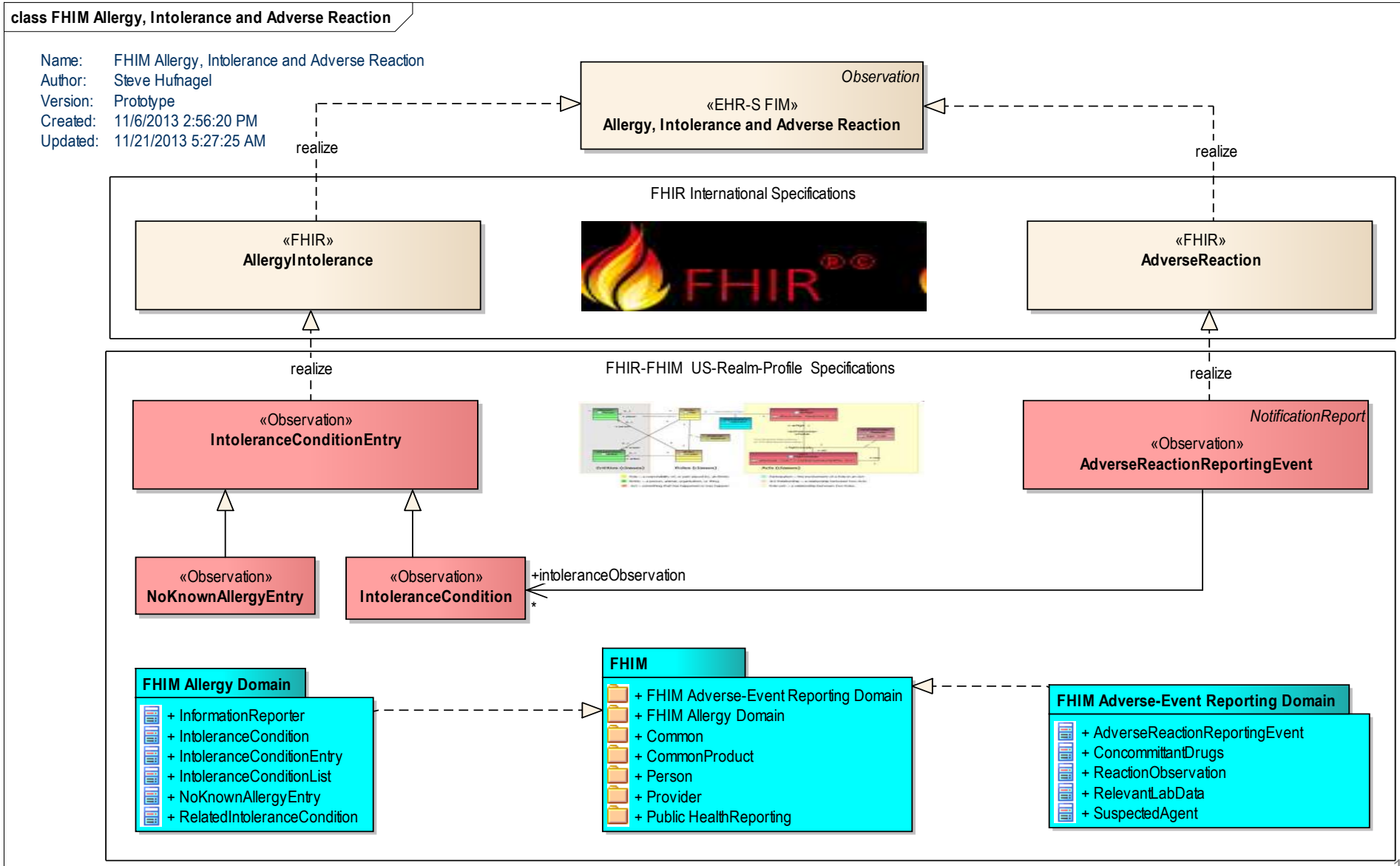
Use-Case Traceability Analysis

CP.6.2 Immunization Management Conformance Criteria

uc EHR-S FIM CP.6.2 Immunization Management Traceability



Example Linkage-to FHIR & FHIM for Allergy, Intolerance & Adverse-Reaction



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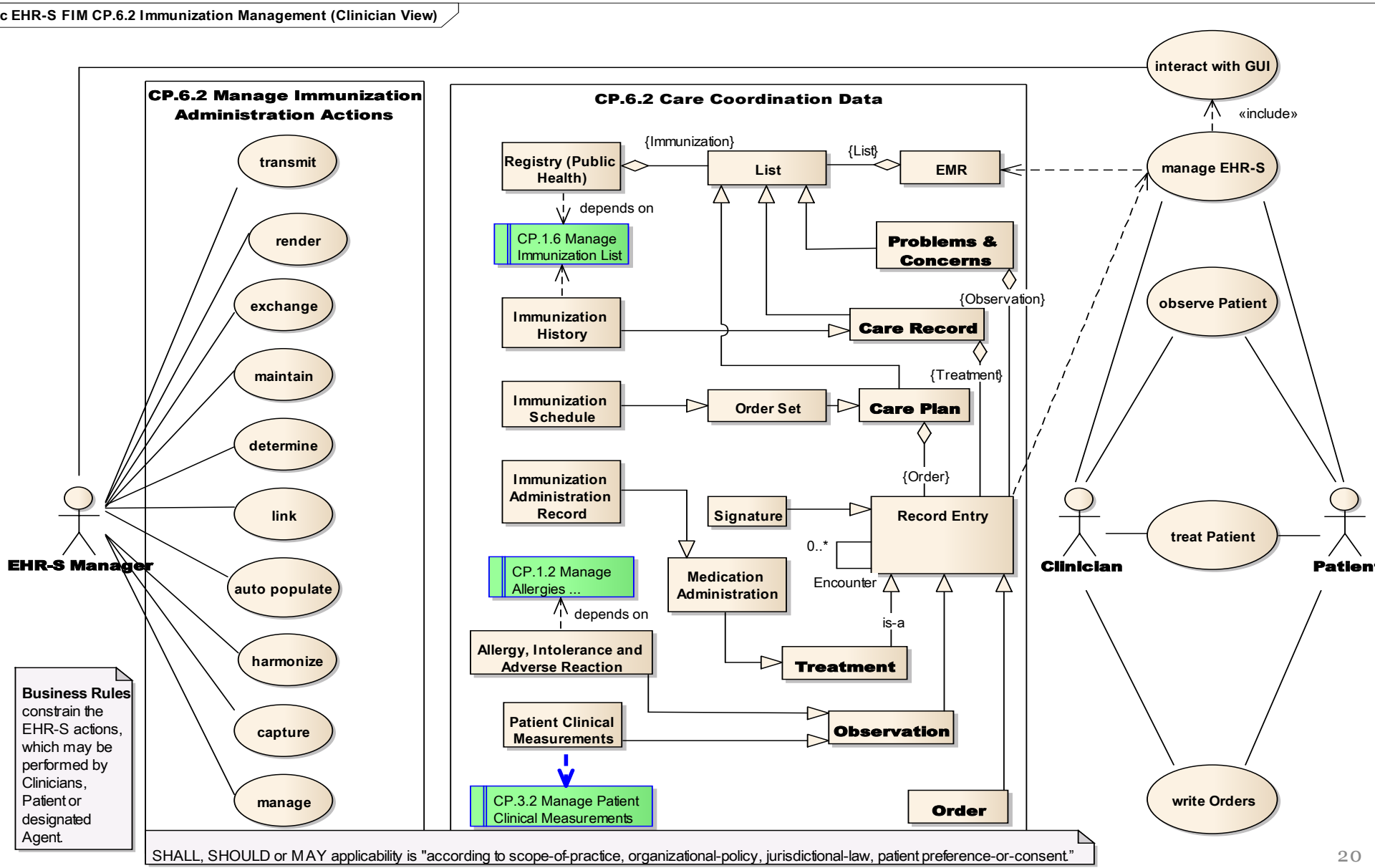
Use-Case Description
CP.6.2 Immunization Management EHR-S FIM Release-3:2016 Preparation

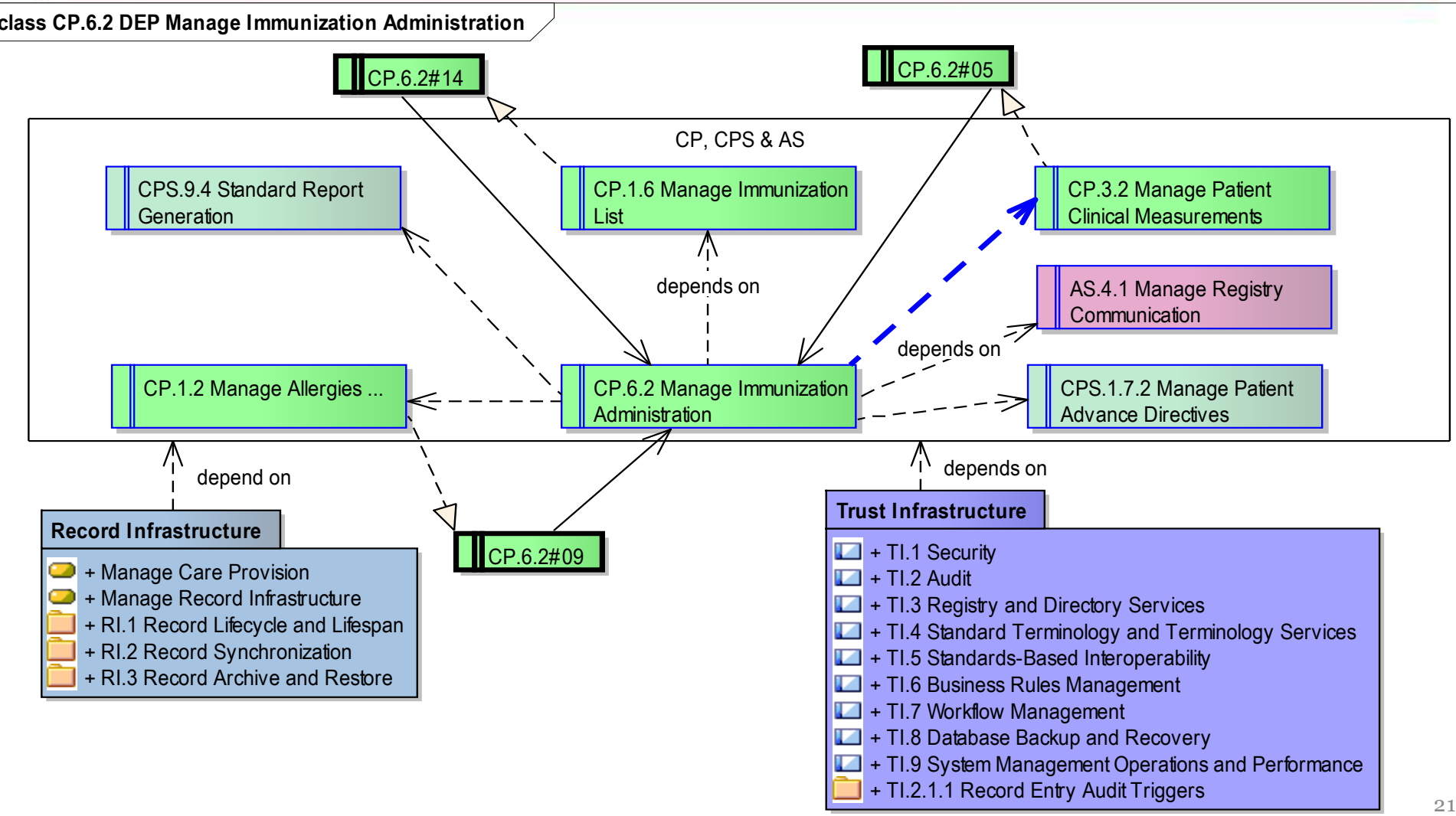
- A Clinician manages the EHR-S to
  - *reviews* the patient's EMR for Allergies and Intolerances, Immunization-Schedule, and Patient Directives
  - Document treatment (*immunizes*) of the Patient with a Vaccine and Adverse-Reaction observations.
  - documents the encounter information.
- The EHR-S Immunization related manager(s) can
  - *Capture, Auto-populate, Maintain, Render, Transmit, Exchange,*
  - *Harmonize, Update, or Determine*
- The following data-modules:
  - Immunization-Administrations, Allergies, Intolerances, Adverse-Events
  - Events, Schedules, Plans and Educational Materials

Use-Case Model

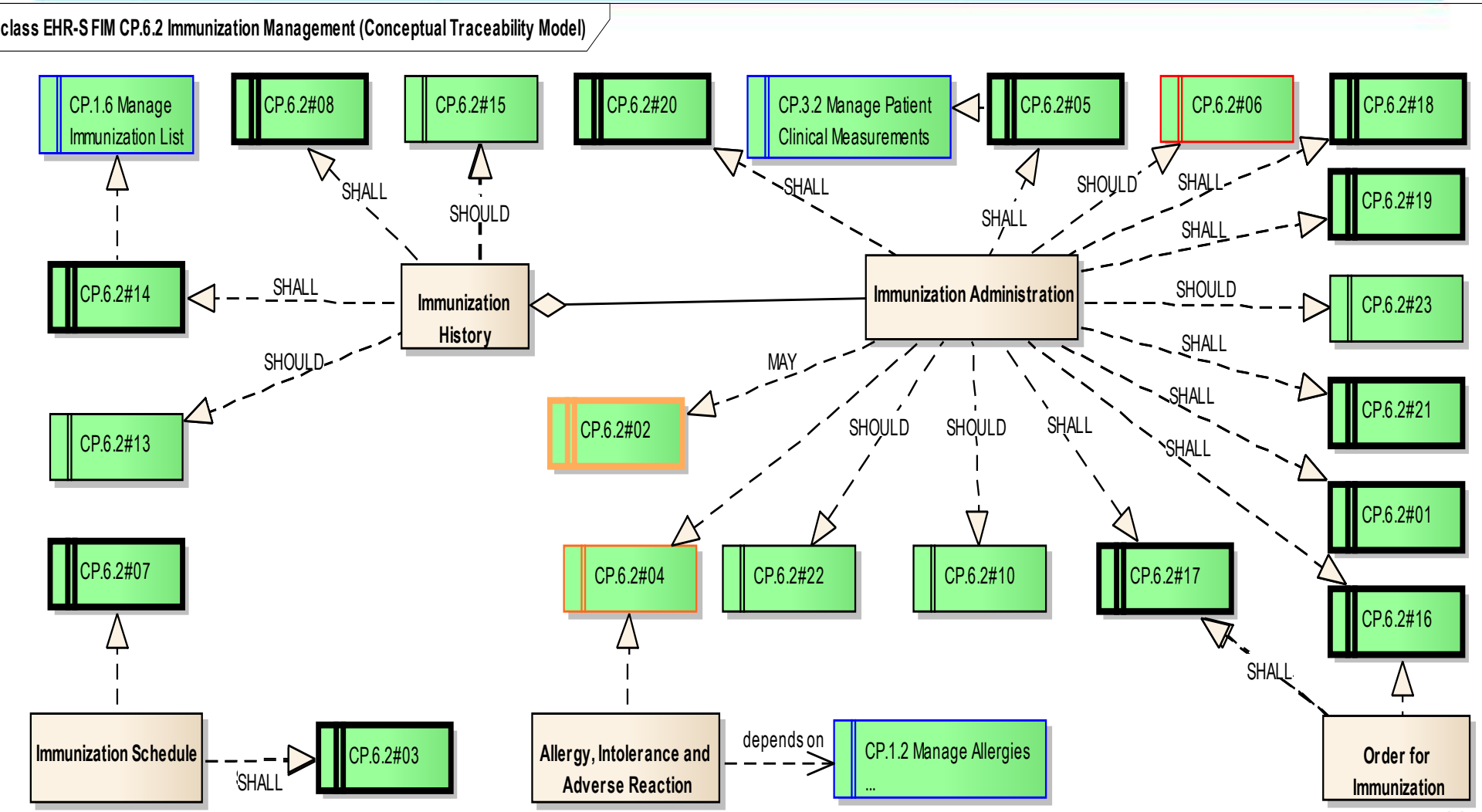
CP.6.2 Immunization Management Conformance Criteria



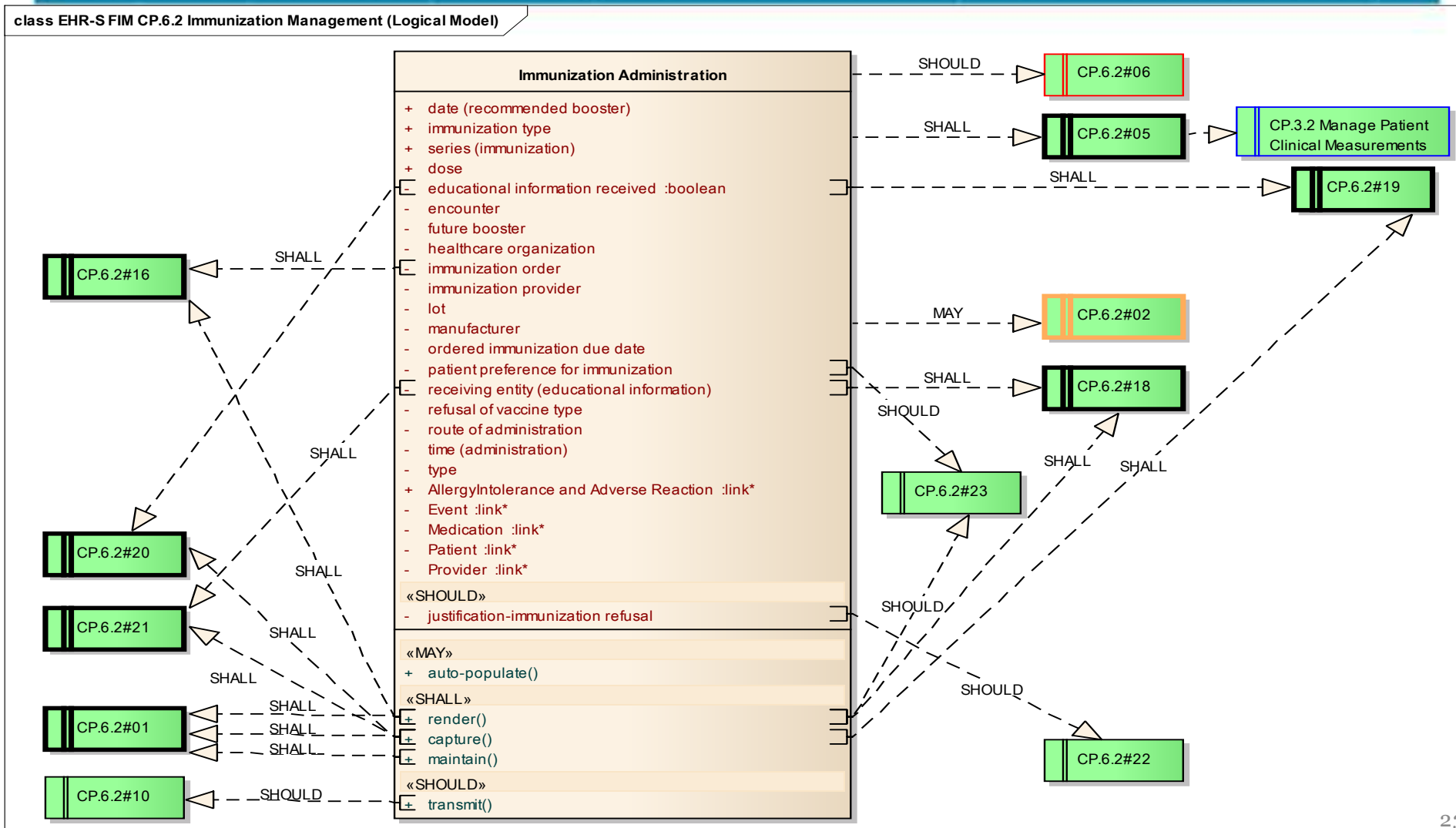
EHR-S-FIM Dependencies
CP.6.2 Immunization Management



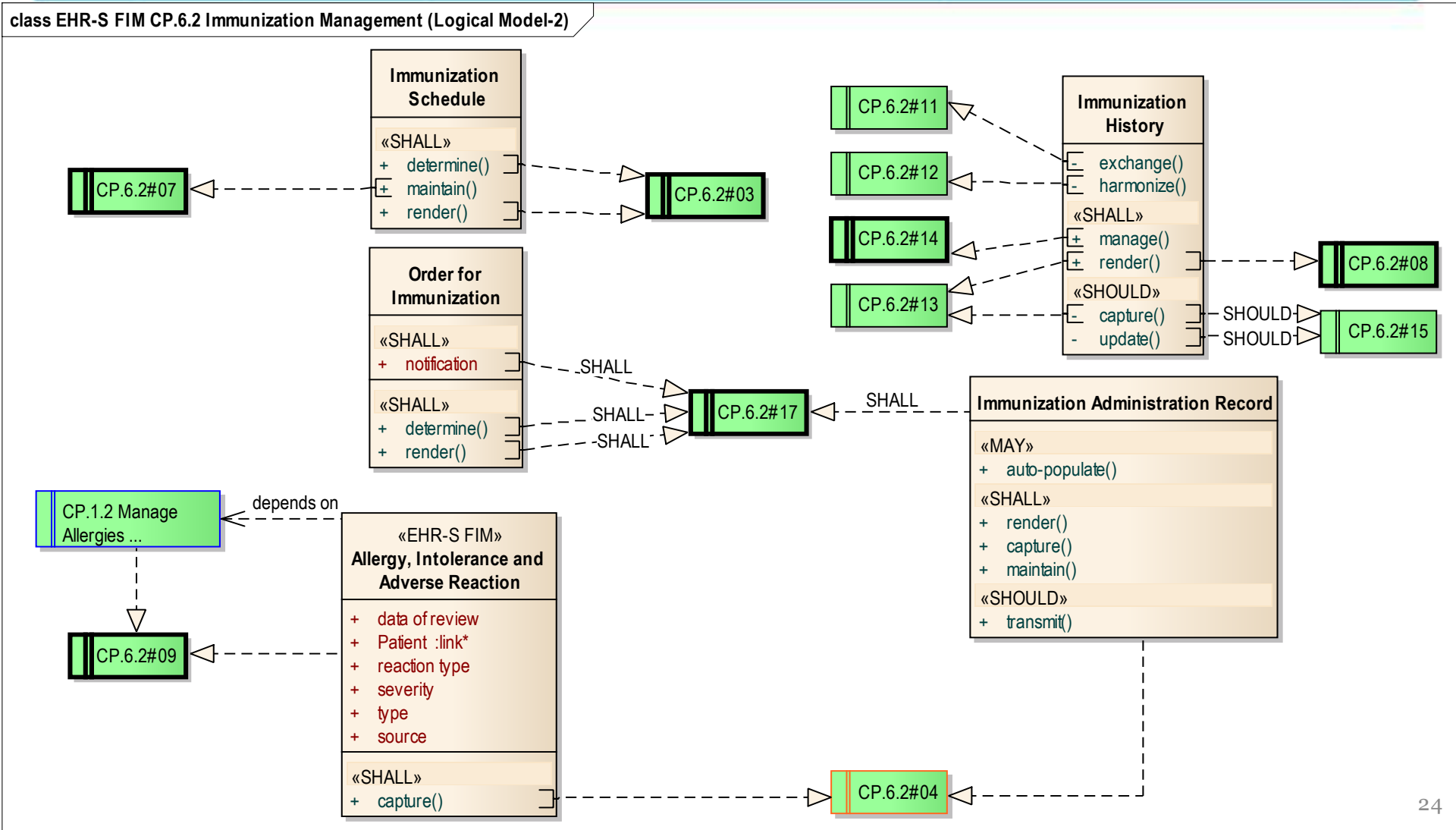
EHR-S-FIM
Traceability Model
CP.6.2 Immunization Management



EHR-S FIM
Logical Traceability-Model
CP.6.2 Immunization Management



EHR-S FIM
Logical Traceability-Model
CP.6.2 Immunization Management



EHR-S-FIM
Conformance Criteria (CCs)
CP.6.2 Immunization Management

1. The system **SHALL** provide the ability to capture, maintain and render immunization administration details as discrete data, including:(1) the immunization name/type, strength and dose;(2) date and time of administration;(3) manufacturer, lot number, expiration date,(4) route and site of administration;(5) administering provider;(6) observations, reactions and complications;(7) reason immunization not given and/or immunization related activity not performed; according to scope of practice, organizational policy and/or jurisdictional law."
2. The system MAY *auto-populate the immunization administration record* as a by-product of verification of administering provider, patient, medication, dose, route and time according to scope of practice, organizational policy and/or jurisdictional law.
3. The system **SHALL** provide the ability to *determine and render required immunizations*, and when they are due, based on widely accepted immunization schedules, when rendering encounter information.
4. The system SHOULD provide the ability to *capture, in a discrete field, an allergy/adverse reaction to a specific immunization*.
5. The system **SHALL** conform to function CP.3.2 (Manage Patient Clinical Measurements) to capture other clinical data pertinent to the immunization administration (e.g., vital signs).
6. The system SHOULD provide the ability to link standard codes (e.g. NDC, LOINC, SNOMED or CPT) with discrete data elements associated with an immunization.
7. The system **SHALL** provide the ability to *maintain the immunization schedule*.
8. The system **SHALL** provide the ability to render a patient's immunization history upon request for appropriate authorities such as schools or day-care centers.
9. The system **SHALL** conform to function CP.1.2 (Manage Allergy, Intolerance and Adverse Reaction List).
10. The system SHOULD transmit required immunization administration information to a public health immunization registry according to scope of practice, organizational policy and/or jurisdictional law.
11. The system SHOULD exchange immunization histories with public health immunization registries according to scope of practice, organizational policy and/or jurisdictional law.

EHR-S-FIM
Conformance Criteria (CCs)
CP.6.2 Immunization Management

ISSUE: Consistency of Conformance Criteria (CC) across related functions, such as Medication-and-Immunization and Orders-and-Results Management.

12. The system SHOULD harmonize Immunization histories with a public health immunization registry according to scope of practice, organizational policy and/or jurisdictional law.
13. The system SHOULD capture and render immunization histories from a public health immunization registry.
14. The system SHALL conform to function CP.1.6 (Manage Immunization List).
15. The system SHOULD provide the ability to update immunization histories at the time of capturing an immunization administration.
16. The system **SHALL** provide the ability to render the immunization order as written (i.e., exact clinician order language) when rendering administration information.
17. "The system **SHALL** provide the ability to determine due and overdue ordered immunizations and render a notification. "
18. The system **SHALL** provide the ability to render a patient educational information regarding the administration (e.g., Vaccine Information Statement (**VIS**)).
19. The system **SHALL** provide the ability to capture that patient educational information (e.g., VIS) was provided at the time of immunization administration.
20. The system **SHALL** provide the ability to capture documentation that patient educational information (e.g., VIS) was provided at the time of immunization administration.
21. The system **SHALL** provide the ability to capture the receiving entity (e.g., patient, representative, organization) when patient education information is provided at the time of immunization administration.
22. The system SHOULD provide the ability to capture and maintain immunization refusal reasons as discrete data.
23. The system SHOULD provide the ability to capture patient preferences regarding receipt of immunization (e.g. refusal of certain vaccine types) at time of immunization administration.

Interim Conclusions
EHR-S FIM r3.0:2016

- We have looked at Medication-and-Immunization Management, Orders-and-Results Management and Record Entry Management.
- The EHR-S RM (reference model) is used to structure EHR-S functions-and-data; where, the function's conformance-criteria lexicon defines the grammar of nouns (entities), verbs (record-entry actions) and constraints (conditions).
- The EHR-S Conceptual Information Model (CIM) and Conceptual Operations Model (COM) for CP.6.2 Immunization Management should generally-be-applicable for all of the Care Provisioning (CP) section of the EHR-S FM; where,
  - minor CIM modifications will likely occur as we analyze the rest of the CP section; but,
  - major COM components still must be substantially developed based-on the Record-Infrastructure and Trust-Infrastructure sections.

Interim Conclusion
EHR-S FIM
CP.6.2 Immunization Management

- Based on the Medication Management, Orders Management and Immunization Management functions, we see
  - A high-level EHR-S Information Model emerging as a set of
    - Patients, Providers, External Partners, Encounters, EMRs, Care Plans, Lists , Managers, Documents and Notes;
  - A high-level EHR-S Manager Model is emerging to
    - *Capture, Auto-populate, Maintain, Render, Transmit, Exchange, Harmonize, Update, Determine*

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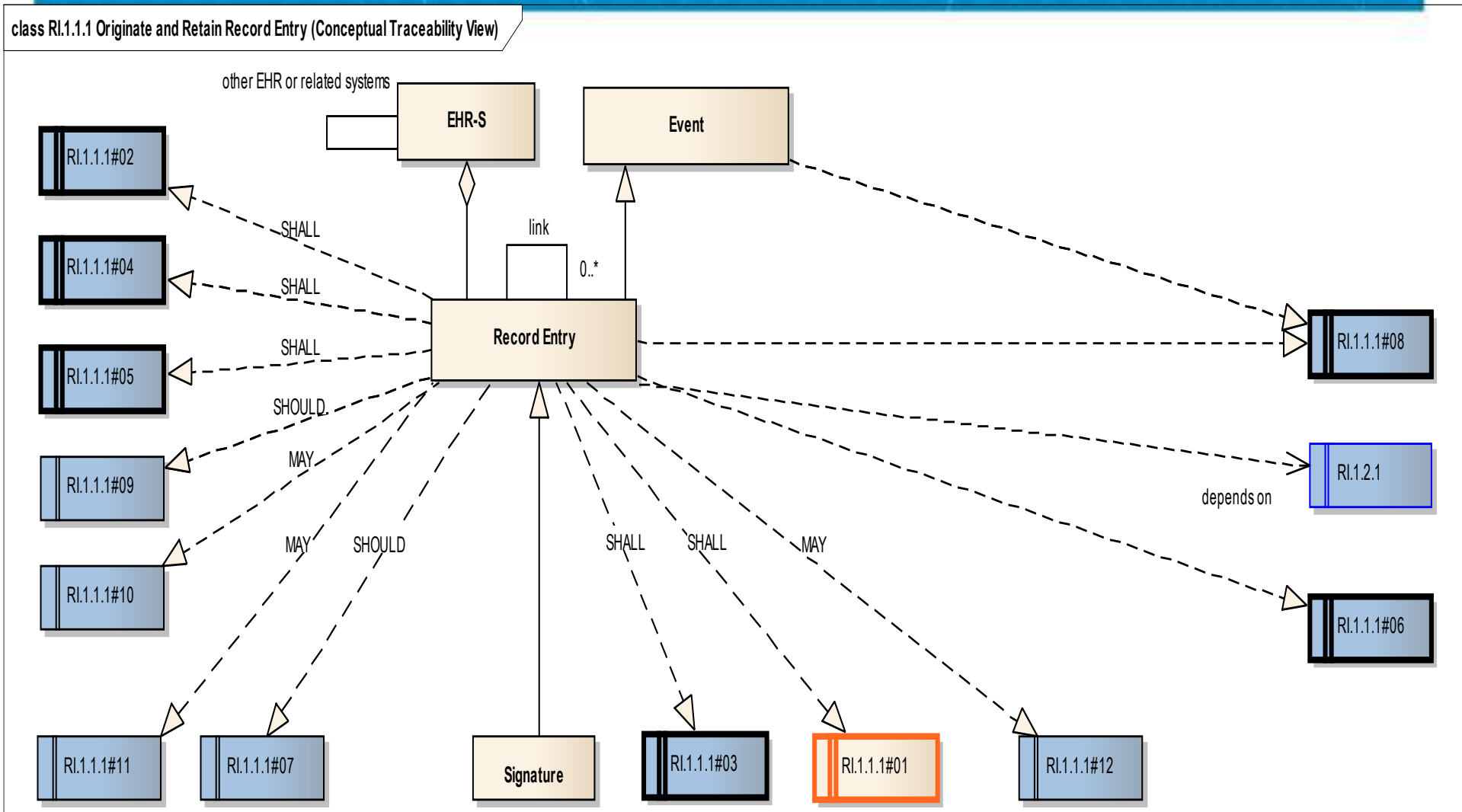
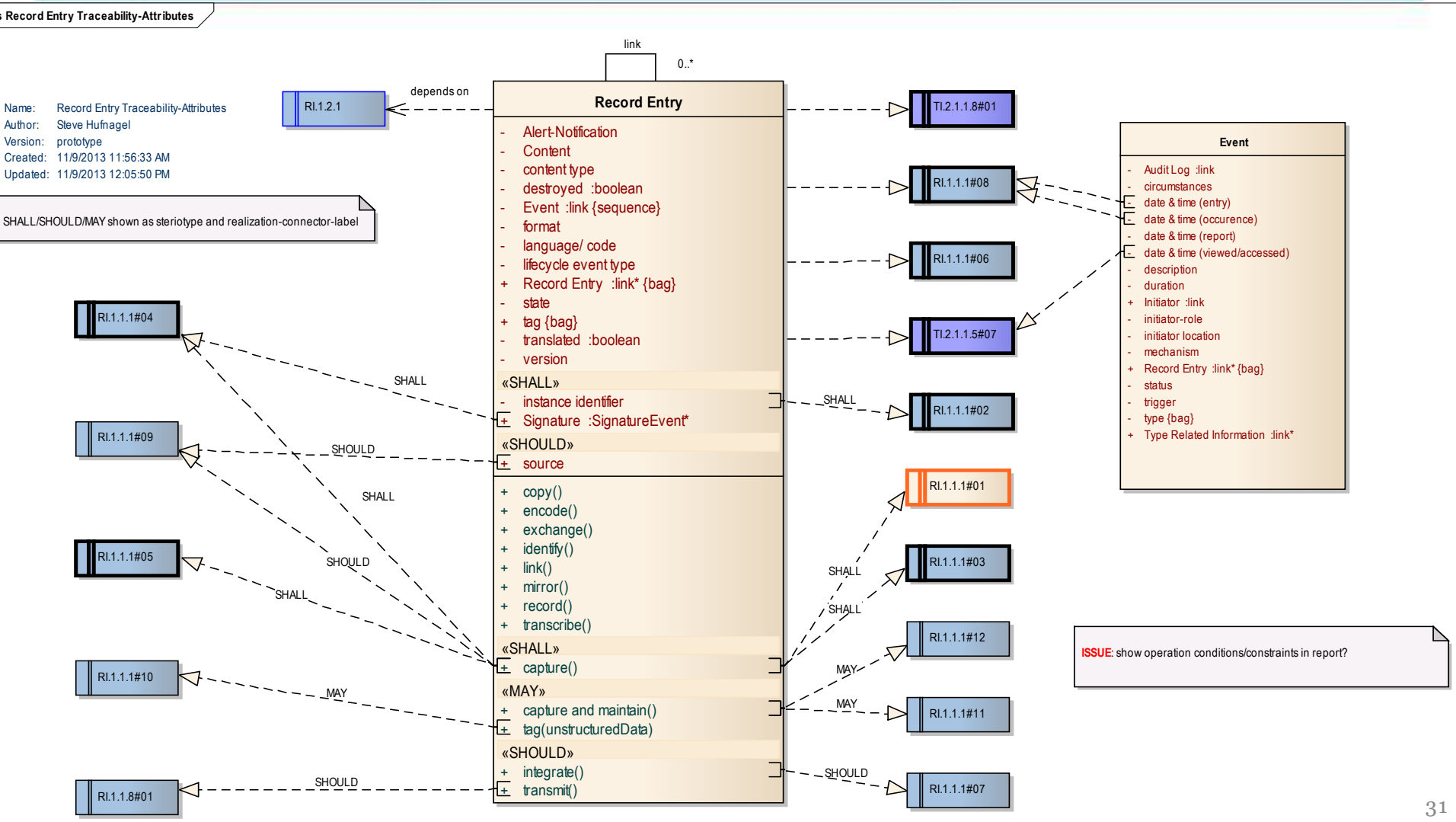
EHR-S FIM
Conceptual Information Model (CIM)
RI.1.1.1 Originate and Retain Record Entry



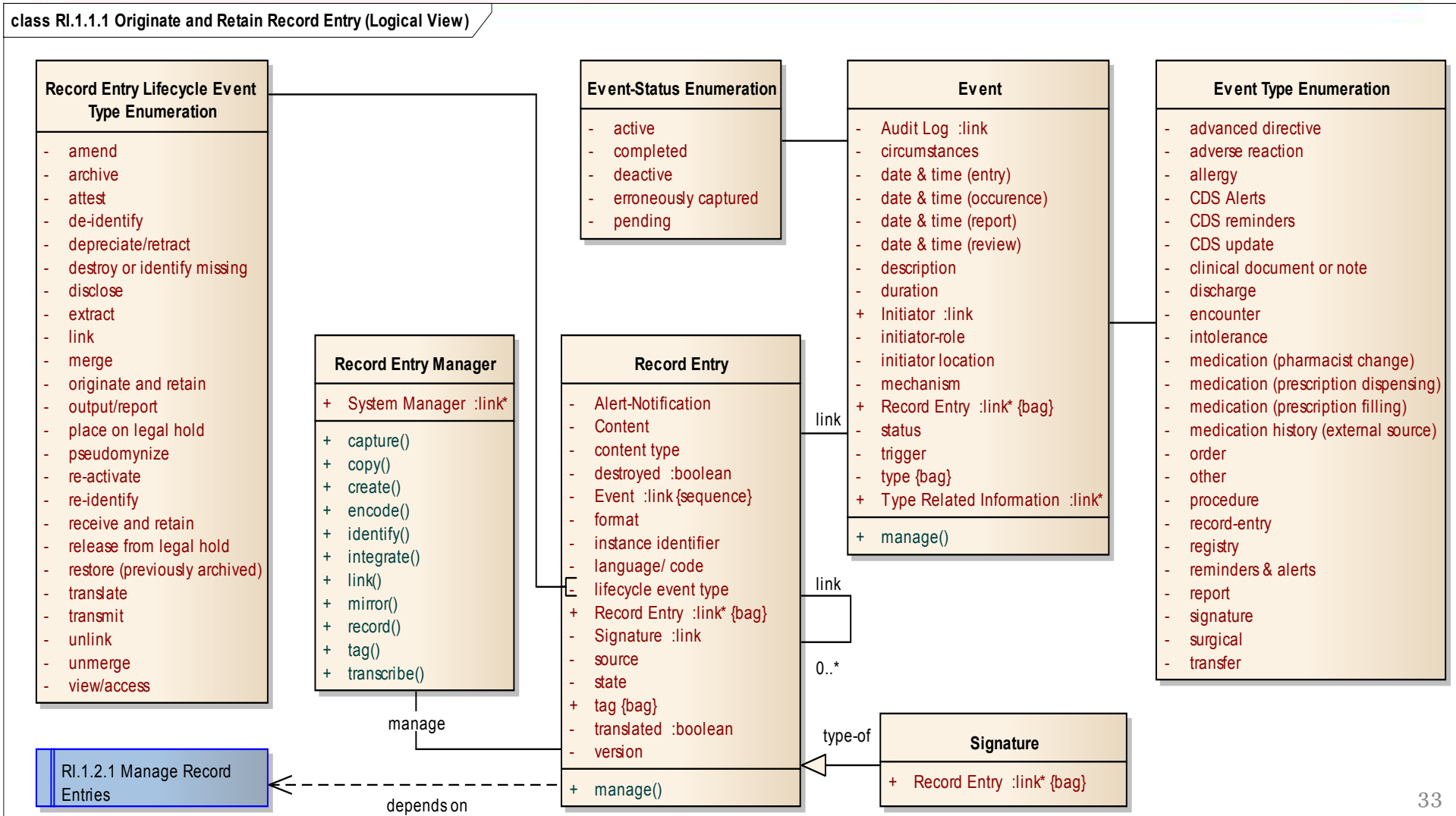
EHR-S FIM
Traceability View
RI.1.1.1 Originate-and-Retain Record Entry



Conformance Criteria (CC)
RI.1.1.1 Originate-and-Retain Record-Entry

1. RI.1.1.1#01 The system **SHALL** provide the ability to capture (originate) a Record Entry instance corresponding to an Action instance and context.
2. RI.1.1.1#02 The system **SHALL** capture a unique instance identifier for each Record Entry.
3. RI.1.1.1#03 The system **SHALL** conform to function TI.2.1.1.1 (Originate/Retain Record Entry Audit Trigger), including specified metadata.
4. RI.1.1.1#04 The system **SHALL** capture the signature event (e.g., digital signature) of the origination entry Author, binding signature to Record Entry content.
5. RI.1.1.1#05 The system **SHALL** provide the ability to capture both structured and unstructured content in Record Entries.
6. RI.1.1.1#06 The system **SHALL** provide the ability to capture Record Entries from information recorded during system downtime.
7. RI.1.1.1#07 The system SHOULD provide the ability to integrate Record Entries from Information recorded during system downtime.
8. RI.1.1.1#08 The system **SHALL** provide the ability to capture date/time an Action was taken or data was collected if different than date/time of the Record Entry.
9. RI.1.1.1#09 The system SHOULD capture metadata that identifies the source of non-originated Record Entry (e.g., templated, copied, duplicated, or boilerplate information).
10. RI.1.1.1#10 The system MAY provide the ability to tag unstructured Record Entry content to organize it according to need, for example, in a time-related fashion or by application-specific groups (such as photographs, handwritten notes, or auditory sounds)
11. RI.1.1.1#11 The system MAY capture and maintain a Record Entry encoded as a standards-based data object (e.g., HL7 Continuity of Care or other HL7 CDA R2 Document).
12. RI.1.1.1#12 The system MAY capture and maintain a standards-based data object to mirror (be duplicate and synchronous with) internal Record Entry representation.

EHR-S FIM
Logical View
RI.1.1.1 Originate-and-Retain Record Entry



EHR-S FIM
RI.1.1.1 Originate and Retain Record Entry

Resultant Description (Notional Scenario)

- The EHR-S Record-Entry manager can
  - *Capture, Create, Copy, Record, Transcribe*, *Identify,*
  - *Link, Tag, Encode, Mirror, and Integrate*
- Record-Entries as
  - structured or unstructured-data link-to associated
    - Event-Metadata and Signatures.

Interim Conclusion
EHR-S FIM
RI.1.1.1 Originate and Retain Record Entry

we have only looked at the RI.1.1.1 function; yet,

- we see that the emergence of common Record-Entries, Events, Record Entries and a Record Entry Manager
- which can *Capture, Create, Copy, Record, Transcribe, Identify, Link, Tag, Encode, Mirror, Integrate*
  - structured-data or unstructured-data and link-to
  - associated Event-Metadata and Signature.

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EHR-S FIM Using FHIR

ISSUE: EHR-S FM r2.0 Implied Information Model is Ad-Hoc; where, FHIR & FHIM Information Model & Data Dictionary are Configuration Managed.

- **FHIR Administrative**
  - **Attribution**: Patient, RelatedPerson, Practitioner, Organization
  - **Resources**: Device, Location, Substance, Group
  - **Workflow Management**: Encounter, Alert, Supply, Order, OrderResponse
  - **Financial**: Coverage
- **FHIR Clinical**
  - **General**: AdverseReaction, AllergyIntolerance, CarePlan, FamilyHistory, Condition, Procedure, Questionnaire
  - **Medications**: Medication, MedicationPrescription, MedicationAdministration, MedicationDispense, MedicationStatement, Immunization, ImmunizationProfile
  - **Diagnostic**: Observation, DiagnosticReport, DiagnosticOrder, ImagingStudy, Specimen
  - **Device Interaction**: DeviceCapabilities, DeviceLog, DeviceObservation
- **FHIR Infrastructure**
  - **Support**: List, Media, Other, DocumentReference, (Binary)
  - **Audit**: Provenance, SecurityEvent
  - **Exchange**: Document, Message, OperationOutcome, Query
  - **Conformance**: Conformance, ValueSet, Profile

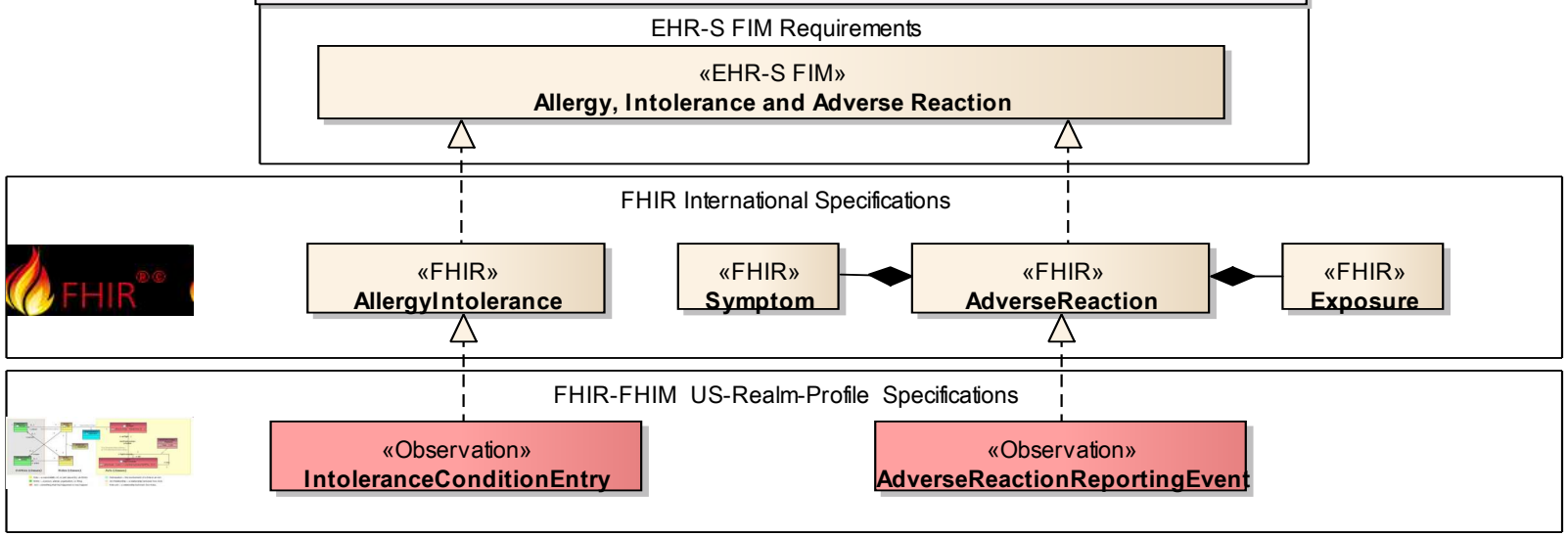
EHR-S FIM Prototype
Allergy, Intolerance & Adverse-Reaction
FIM-FHIR-FHIM Requirements-Specifications

ISSUE: Should we map at Data Module Level or Conformance Criteria level? [Gary]

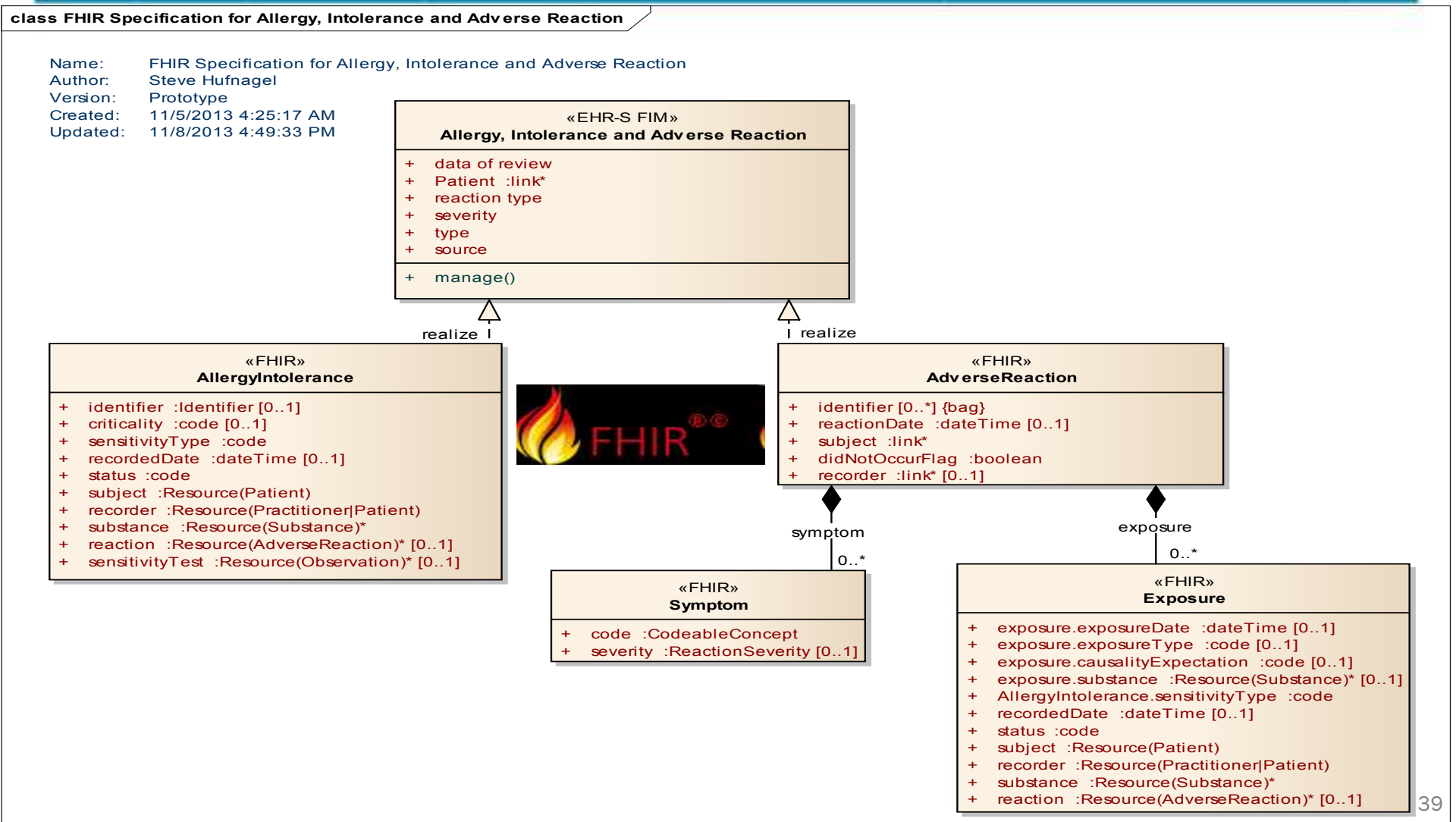
Name: FHIR-FHIM High-Level Specification for Allergy, Intolerance and Adverse Reaction
Author: Steve Hufnagel
Version: Prototype
Created: 11/7/2013 4:26:03 AM
Updated: 11/18/2013 9:07:42 AM

The 2016 EHR-S FIM release-3 objective is for an analyst-or-architect to use the EA-tool to
1. Create a use case from a prescribed lexicon of Entities, Events, Modifiers and Actions; where,
2. the lexicon is mapped to applicable EHR System Functions; where,
3. the EA-tool can generate an Interoperability-Specification (IS) containing
- UML EHR-S-FIM/FHIR/FHIM profile, based-on the use-case
- including FHIR-XML (International)
- including FHIR-FHIM-XML (US Realm) with appropriate terminology value-set binding;
- Where, other realm models could be added to the EA-tool by interested stakeholders
- profiles can be further refined to support local needs.

EHR-S-FIM is EHR System Function-and-Information model
FHIR is Fast Healthcare Interoperability Resource
FHIM is US Federal Health Information Model



Prototype
Allergy, Intolerance & Adverse-Reaction FHIR Design-Specification



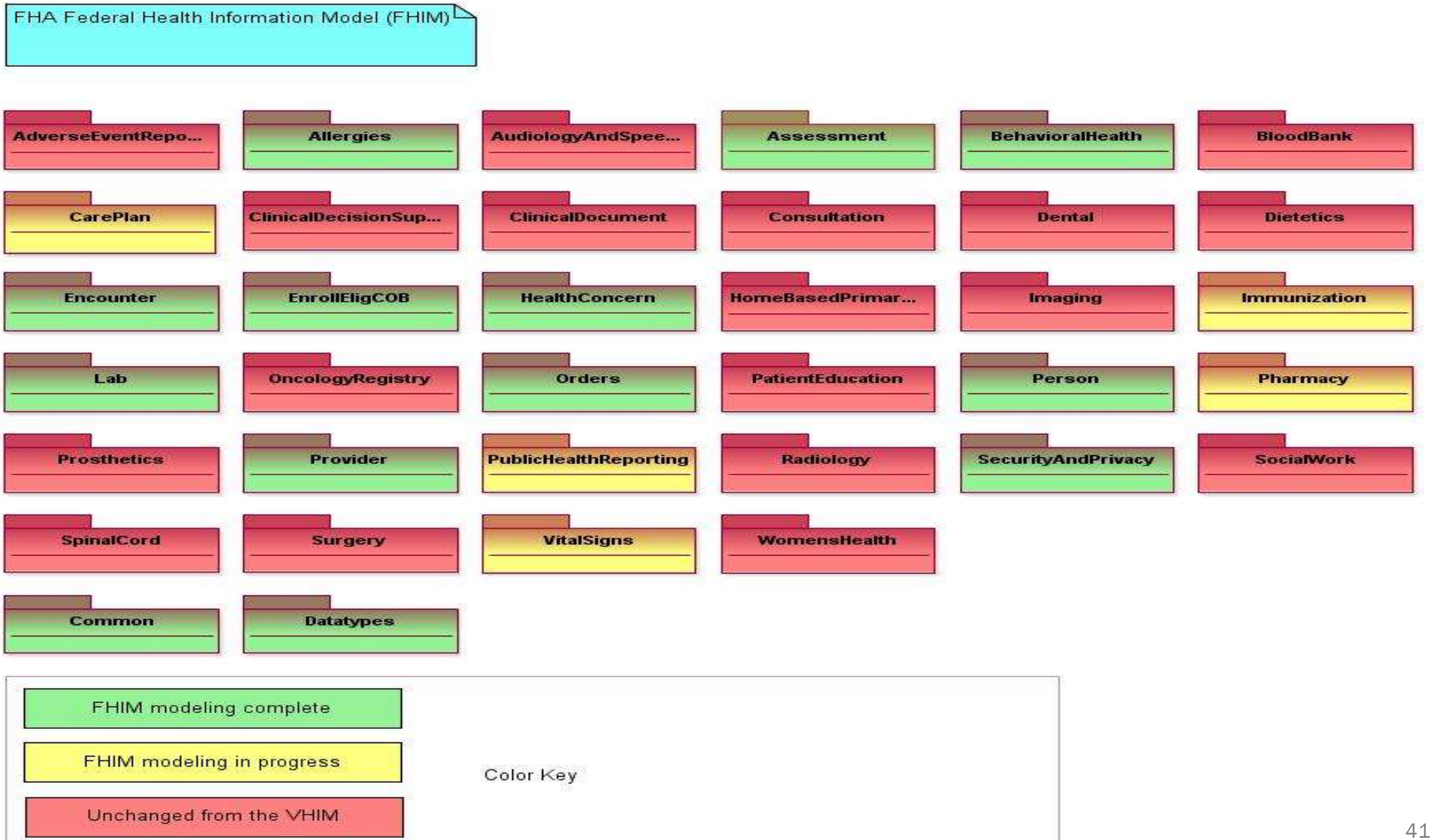
Contents
FY2014Q1-Prototype Report
EHR-S FIM Release-3:2016 Preparation

1. Introduction, Executive-Summary, Plan-of-Actions & Milestones
2. Concept-of-Operation and Reference-Model
3. CP.6.2 Immunization-Management Modeling-Prototype
4. RI.1.1.1 Originate and Retain Record Entry Modeling-Prototype
5. EHR-S FIM use of FHIR for Allergy, Intolerance and Adverse-Reaction
6. **EHR-S FIM use of FHIM for Allergy, Intolerance and Adverse-Reaction**
7. Traceability

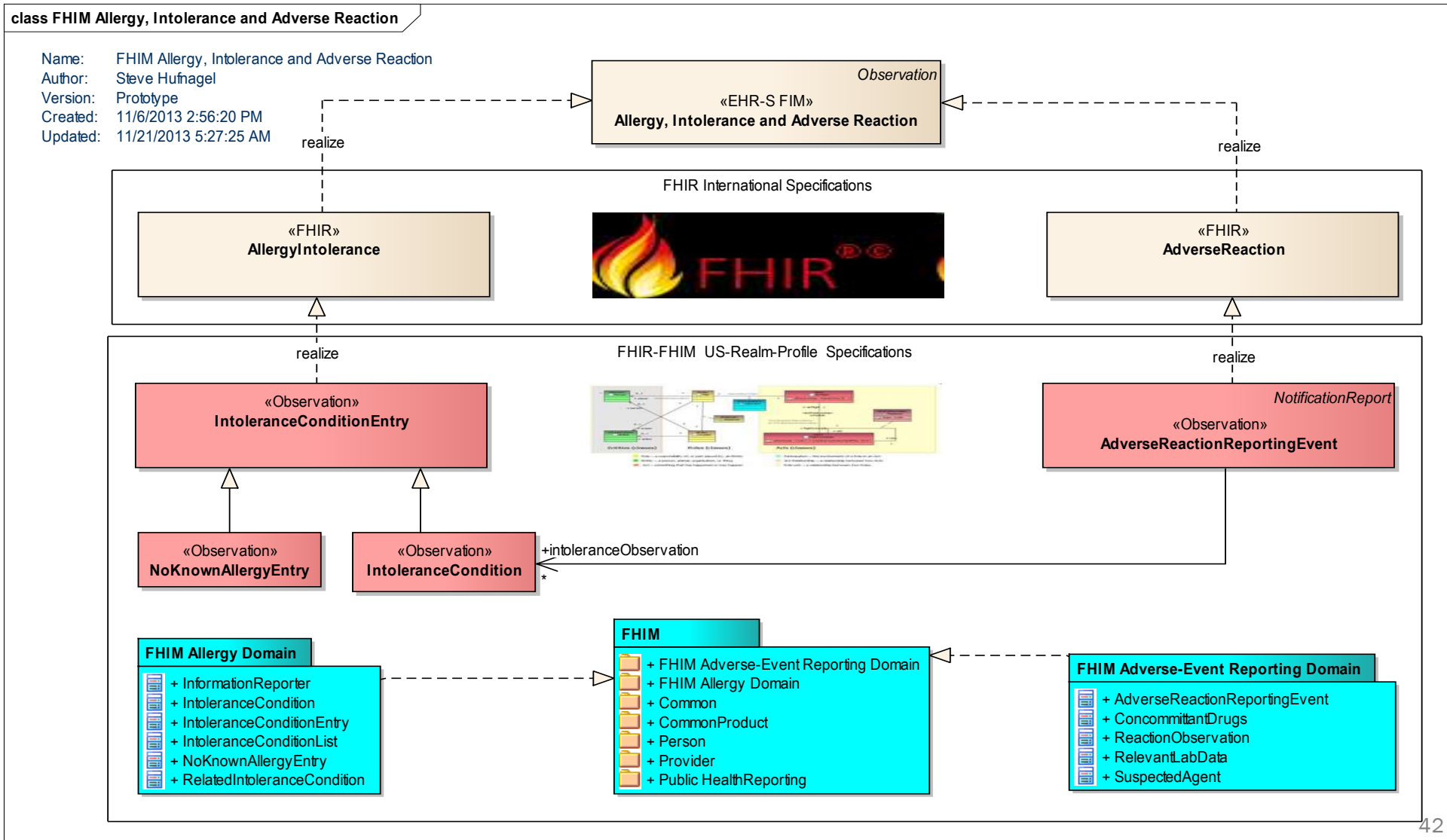
The complete-and-current HL7 EHR-System Function-and-Information Model Release-3 Development-Summary Presentation, dated November-2013 is available at **http://wiki.hl7.org/index.php?title=EHR_Interoperability_WG**

EHR-S FIM Using Federal Health Information Model (FHIM)

http://www.fhims.org/content/420A62FD03B6_root.html



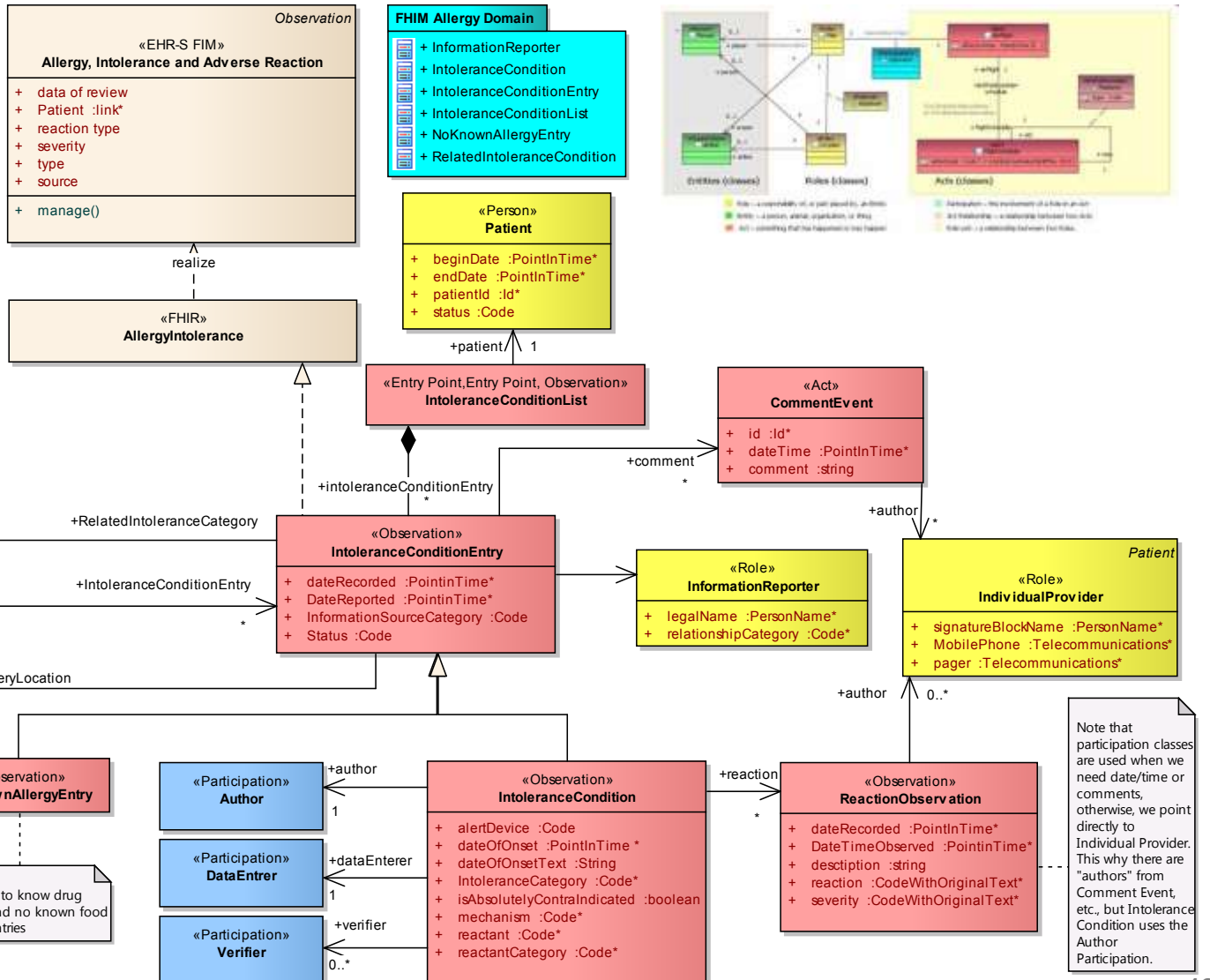
Prototype
Allergy, Intolerance & Adverse-Reaction
FHIM High-Level US-Realm Specification



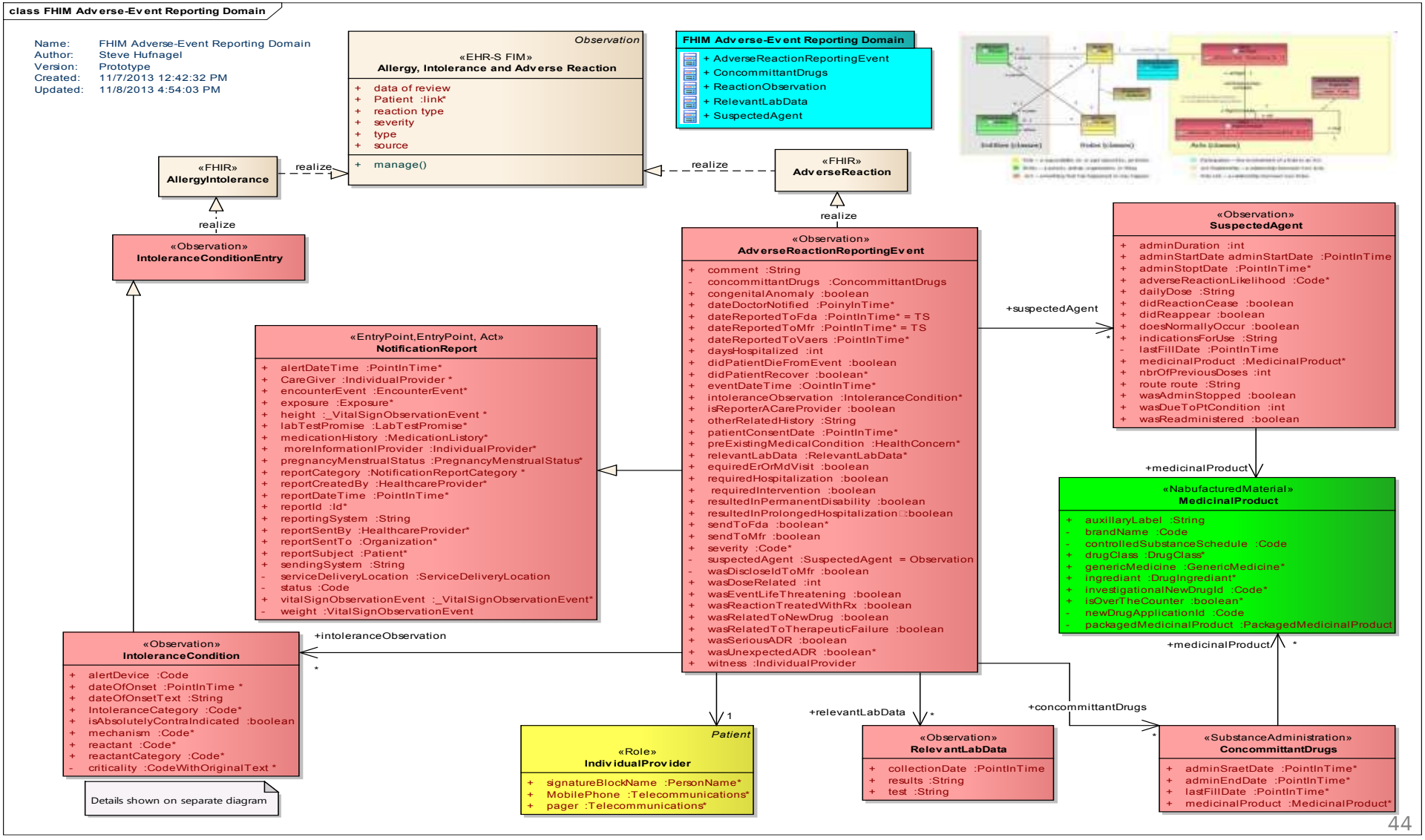
Prototype
FHIM-Detailed Allergy & Intolerance Specification

class FHIM Allergies Domain

Name: FHIM Allergies Domain
Author: Steve Hufnagel
Version: Prototype
Created: 11/6/2013 4:40:24 AM
Updated: 11/8/2013 4:50:55 PM



Prototype
FHIM Detailed Adverse-Reaction Specification



Prototype
Allergy, Intolerance & Adverse-Reaction FHIR & FHIM Design-Specifications

INTERIM CONCLUSION

EHR-S FIM, FHIR and FHIM complement each other; where,

- EHR-S FIM defines Requirements; where,
  - EHR-S FIM needs data-specifications and Dictionary and
  - FHIR & FHIM provide data-specifications and Dictionary
- FHIR defines the International Data-Specifications ("The 80% set")
- FHIM can define the US-FHA FHIR-Profile
- Joint Configuration Management is essential for FIM/FHIR/FHIM consistent

A FIM-FHIR-FHIM populated UML-Tool (e.g., EA or RSA) can manage

- **Requirements** from EHR-S FIM
- **International Data-Specification**s from FHIR
- **US-Realm Data-Specifications-Profile** from FHIM

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EHR-S FIM Issue Traceability

ISSUE: EHR-S FM r2.0 traceability to UML Model Elements to EHR-S FIM r3.0, FHIR & FHIM

- **Workbook 1:** Class attributes & operations mapped-to EHR-S FM r2.0 Functions and LOCAL CCs
- **Workbook 2** Class attributes & operations mapped to EHR-S FIM r3.0 Functions and GLOBAL CCs
- **Workbook 3** EHR-S FM r2.0 Functions and CCs mapped-to EHR-S FIM r3.0 Functions and CCs
- **Workbook 4** EHR-S FM r2.0 Functions and LOCAL Conformance Criteria (**CC**) listed out for linking
- **Workbook 5** EHR-S FIM R3.0 Functions and UNIVERSAL CC listed out for linking
- **Workbook 6** EHR-S FIM UML-Model mapped-to FHIR
- **Workbook 7** EHR-S FIM UML-Model mapped-to FHIM (Federal Health Information Model)
- **Workbook 8** FHIR mapped-to FHIM (Federal Health Information Model)
- **Workbook 9** Master Data Dictionary (DD) (If we use FHIR or FHIM , they already have a DD)
- **ACTION:** Use Sparx EA to implement t raceability.

EHR-S FM Action-Verb Hierarchy
Vs. EHR-S FIM Manager-Operations
VS. Record Lifecycle Events

ISSUE: traceability of CC Verb-Hierarchy vs. Record Lifecycle Events.

Manage (Data)

Capture	Maintain			Render			Exchange	Determine		Manage-Data-Visibility
Auto-Populate Enter Import Receive	Store	Update	Remove	Extract	Present	Transmit	Export Import Receive Transmit	Analyze	Decide	De-Identify Hide Mask Re-Identify Unhide Unmask
	Archive Backup Decrypt Encrypt Recover Restore Save	Annotate Attest Edit Harmonize Integrate Link Tag	Delete Purge							

Record Entry Lifecycle Event Type Enumeration

- originate and retain
- amend
- translate
- attest
- view/access
- output/report
- disclose
- transmit
- receive and retain
- de-identify
- pseudomynize
- re-identify
- extract
- archive
- restore (previously archived)
- destroy or identify missing
- depreciate/retract
- re-activate
- merge
- unmerge
- link
- unlink
- place on legal hold
- release from legal hold

← Record-Entry Lifecycle Events are located here for convenience; but, how do they correspond to Verbs in the verbs hierarchy?.