# Monthly Summary Briefing

## HL7 EHR Work Group (EHR-WG)

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**November 24, 2013** **Frequently-Updated Working-Draft**

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

VA HEALTH CARE Defining EXCELLENCE in the 21st Century

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# 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 Meaningful Use profile
- **FM** Function Model
- **FY** Fiscal Year
- **IHE** **Integrating *the* Healthcare Enterprise**
- **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 r3 Conformance Criteria (CCs) replace ad-hoc-local r2 CCs
    - r3 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)
  - Behavioral Specifications can be included, based-on IHE or other Protocols.

**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 consistently governed and configuration-managed
      iii. The EA tool can generate both a navigable-web-site and printable-report
      iv. user-specific profiles (e.g., WG project DAMs, DIMs, DCMs).can be supported.
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) 6-FTE Man-years
   a. 4 development FTEs + 1 Tooling FTE + 1 Balloting FTE
   b. 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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# Reference Model (RM) Definition
## EHR-S FIM Release-3:2016 Preparation

The EHR-S reference model (RM) framework [based-on OASIS RM definition]

1. Structures significant-relationships among EHR-S entities
   - defined-by EHR-S operational-and-information conceptual-models; where,
   - EHR-S RM conformance criteria contain a constrained-lexicon
     - of nouns (Data-Entities) and qualifiers (Data-Types), bound-to
     - verbs (Operations/Tasks) with constraints {Business Rules},
     - which may be used-as requirements-specifications.
2. Provides a common syntax-and-semantics for the EHR-S and PHR-S models
   - Where, verbs (Operations), nouns (Data Types), constraints are refined within functions.
   - Where, these models are
     - Linked-to implementation standards-technologies-paradigms-or-patterns.
     - Consistent-and-unambiguous across implementations, tests and certifications.

- 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."

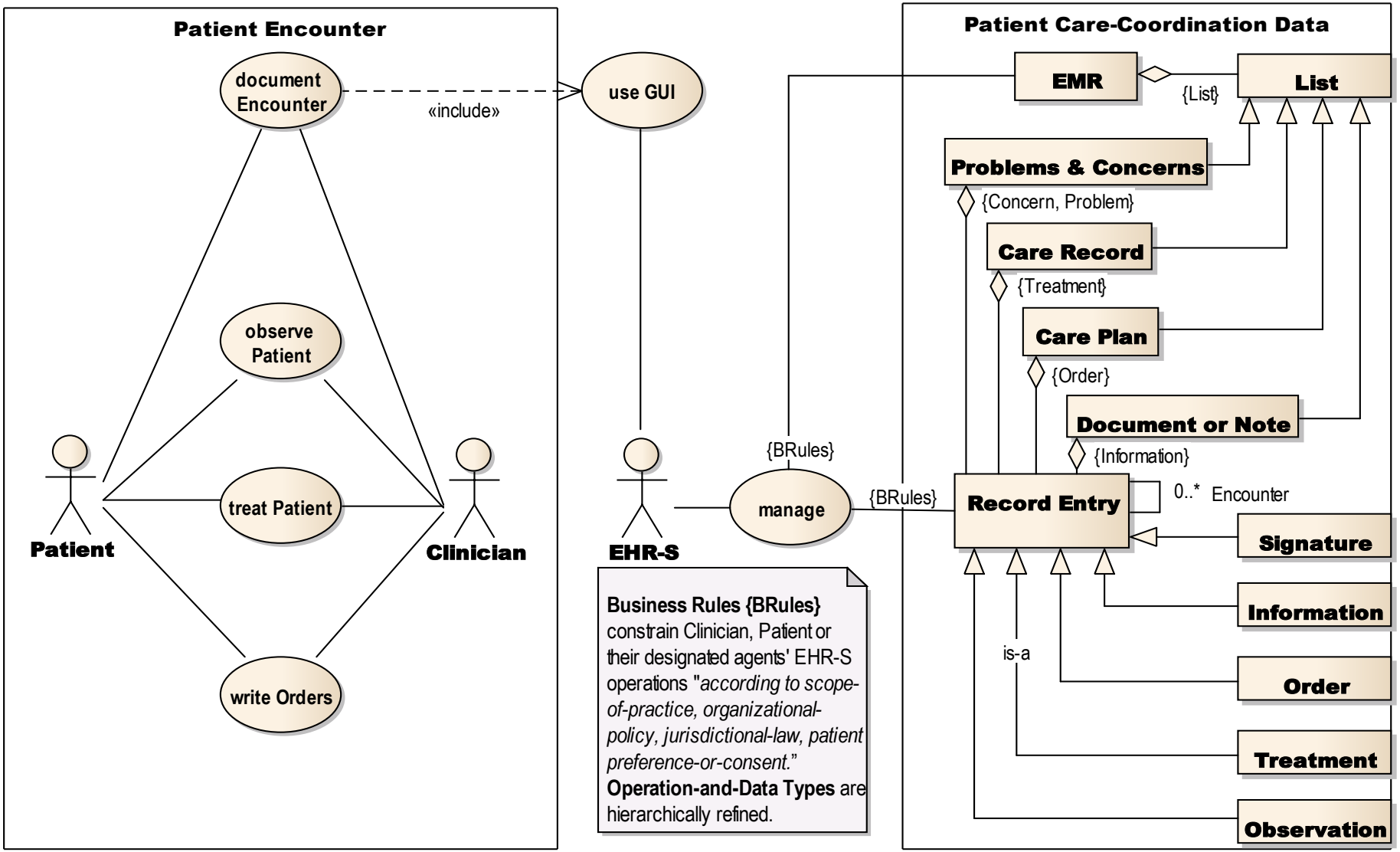
# Concept-of-Operations Reference Scenario
## EHR-S FIM Release-3:2016 Preparation

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* EMRs (Electronic Medical Records), in accordance with scope-of-practice, organizational-policy, jurisdictional-law, and patient-preferences:

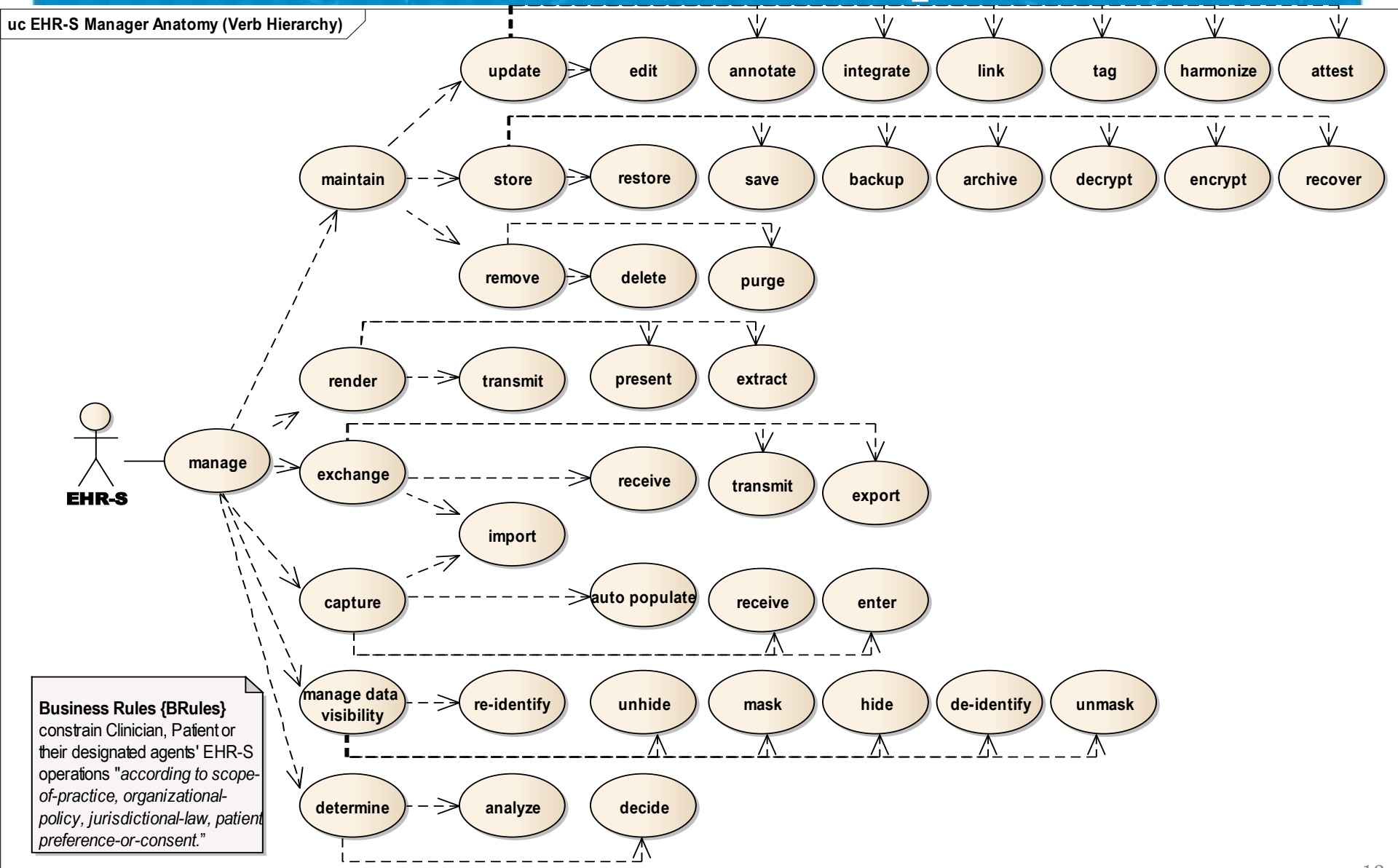
- The Clinician *reviews* the Patient EMR (Electronic Medical Record) and associated Information
- The Clinician *observes and treats the* Patient*, writes-orders and documents* the Encounter
- The Patient *provides* requested-Information and is *provided* educational-Information
- The EHR-S *manages*
  - Encounters are signed by the Clinician(s) and possibly by the Patient; where, they contain
    - Record Entries for Orders, Treatments, Observations and associated Information
    - Record-Entries organized into lists of EMR Care-Plans, Care-Records, Problems-and-Concerns, Documents & Notes

# EHR-S Reference Model (RM)
## EHR-S FIM Release-3:2016 Preparation

**Human Entities and Actions** | **EHR-S Operations** | **EHR-S Data-Entities & Data-Types**



# Operation Sub-Types aka Verb Hierarchy
## EHR-S FIM Release-3:2016 Preparation



# EHR-S Conformance-Criteria RM
## 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."

NOTE: < … > means optional

- **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-S operations linked-to
  - EHR-S Data-Type(s) (Immunization, Vital Sign, lab order)
  - Information Exchange(s) linked-to
    - International Interoperability-Standards (e.g., FHIR, W3C)
    - <Realm Interoperability-Specifications (e.g., FHIM, HITSP)>
    - <Implementation Guides (e.g., CDC Iz., CCDA>
    - <Behavioral Interoperability-Specifications (e.g., IHE)>
    - <Service Level Agreement (e.g., local workflow)>
- **Associations & Dependencies**
  - Supporting components and functions
- **See Also**
  - Functions with significant common CCs

# 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, linked-to Immunization FHIR (Fast Healthcare Interoperability Resource); where, the Immunization data is associated with the following resources:

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

And within the US Realm, the Immunization and associated resources are linked-to FHIM (Federal Health Information Model) Domains of:

- Immunization, Adverse Reaction, Allergy and Intolerance, Care-Plan,
- Encounter, Health Concern, Person, Provider, Public Health Reporting, Patient Education, Vital Signs.

# Interim Conclusions
## EHR-S FIM r3.0:2016 Preparation

- We have looked at Medication-and-Immunization Management, Orders-and-Results Management and Record Entry Management; where,
  - The EHR-S RM (reference model) was used to structure EHR-S functions-and-data; where, the function's conformance-criteria lexicon defines the grammar of nouns (entities), qualifiers (data-types), 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.

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

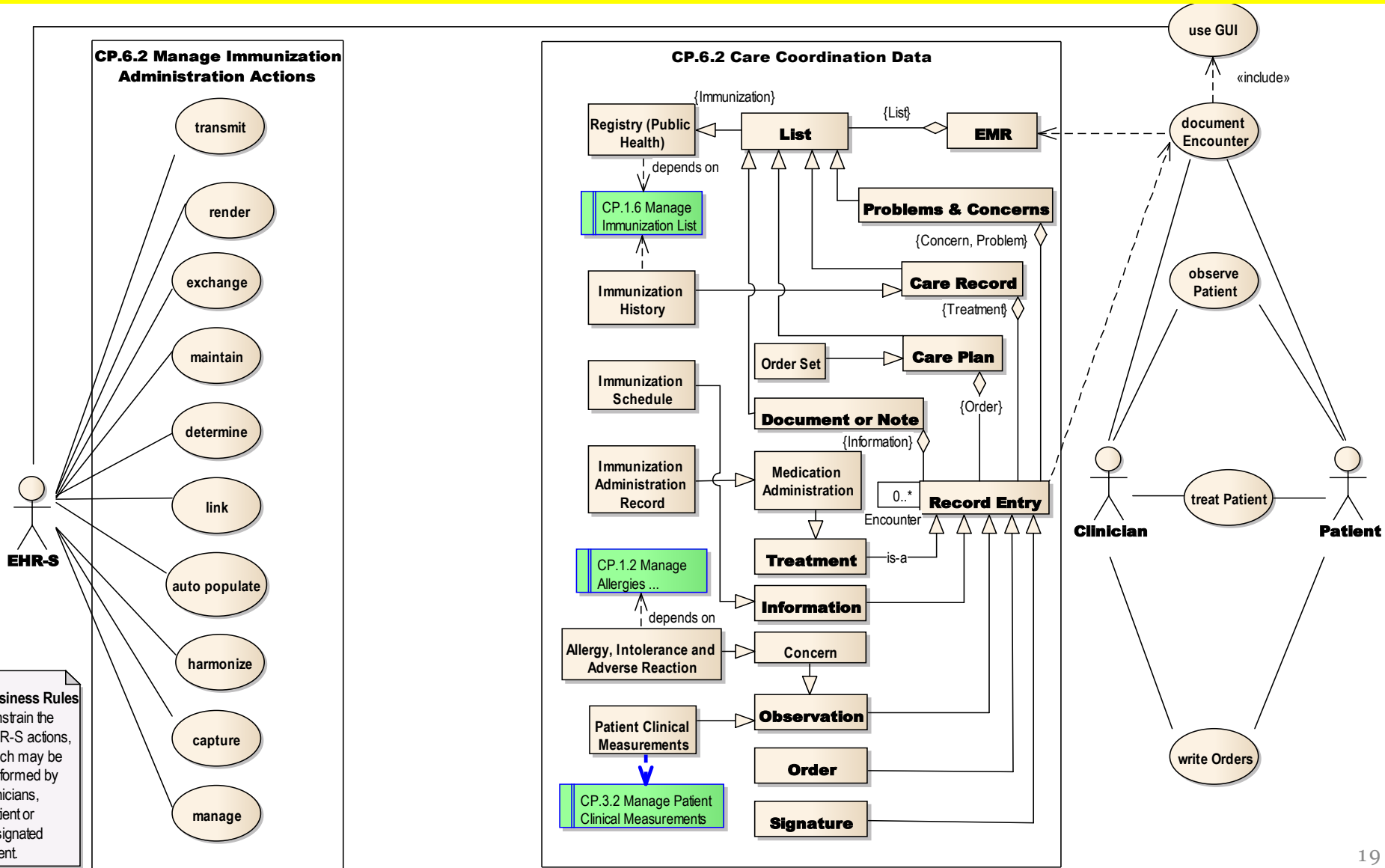
"According to scope-of-practice, organizational-policy, Jurisdictional-law, patient preference-or-consent,"

- A Clinician *uses* the EHR-S to
  - document the encounter information.
  - *review* the patient's EMR for Allergies and Intolerances, Immunization-Schedule, and Patient Directives
  - Document Patient Immunization Administration and Adverse-Reaction observation.
- The EHR-S manager can
  - *Capture, Auto-populate, Maintain, Render, Transmit, Exchange,*
  - *Harmonize, Update, or Determine*
- The following data-types:
  - Immunization-Administrations, Allergies, Intolerances, Adverse-Events
  - Events, Schedules, Plans and Educational Materials

# Use-Case Conceptual-Model

## CP.6.2 Immunization Management Conformance Criteria

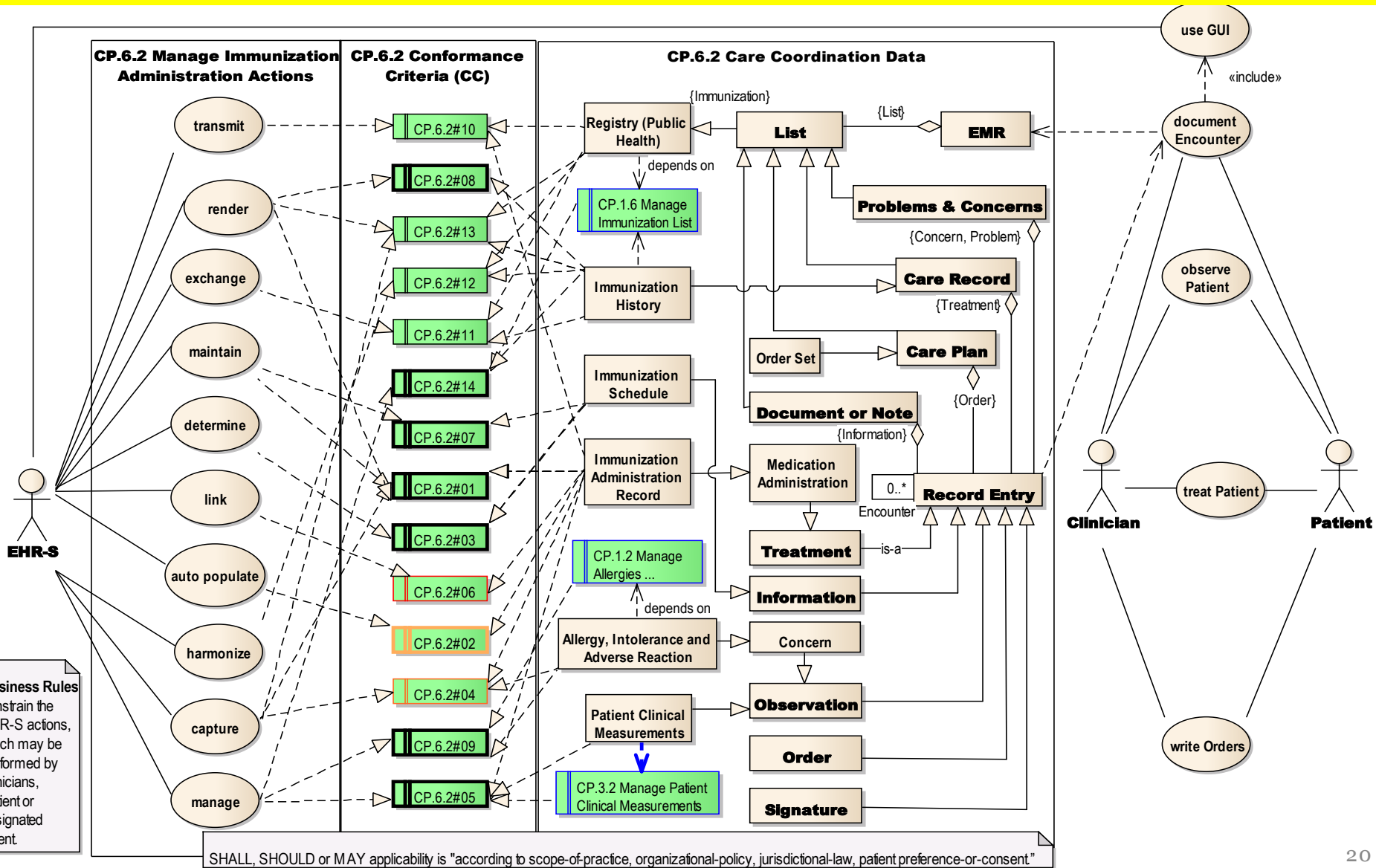
**EHR-S Operations** | **EHR-S Data-Types & Data-Entities** | **Human Entities and Actions**



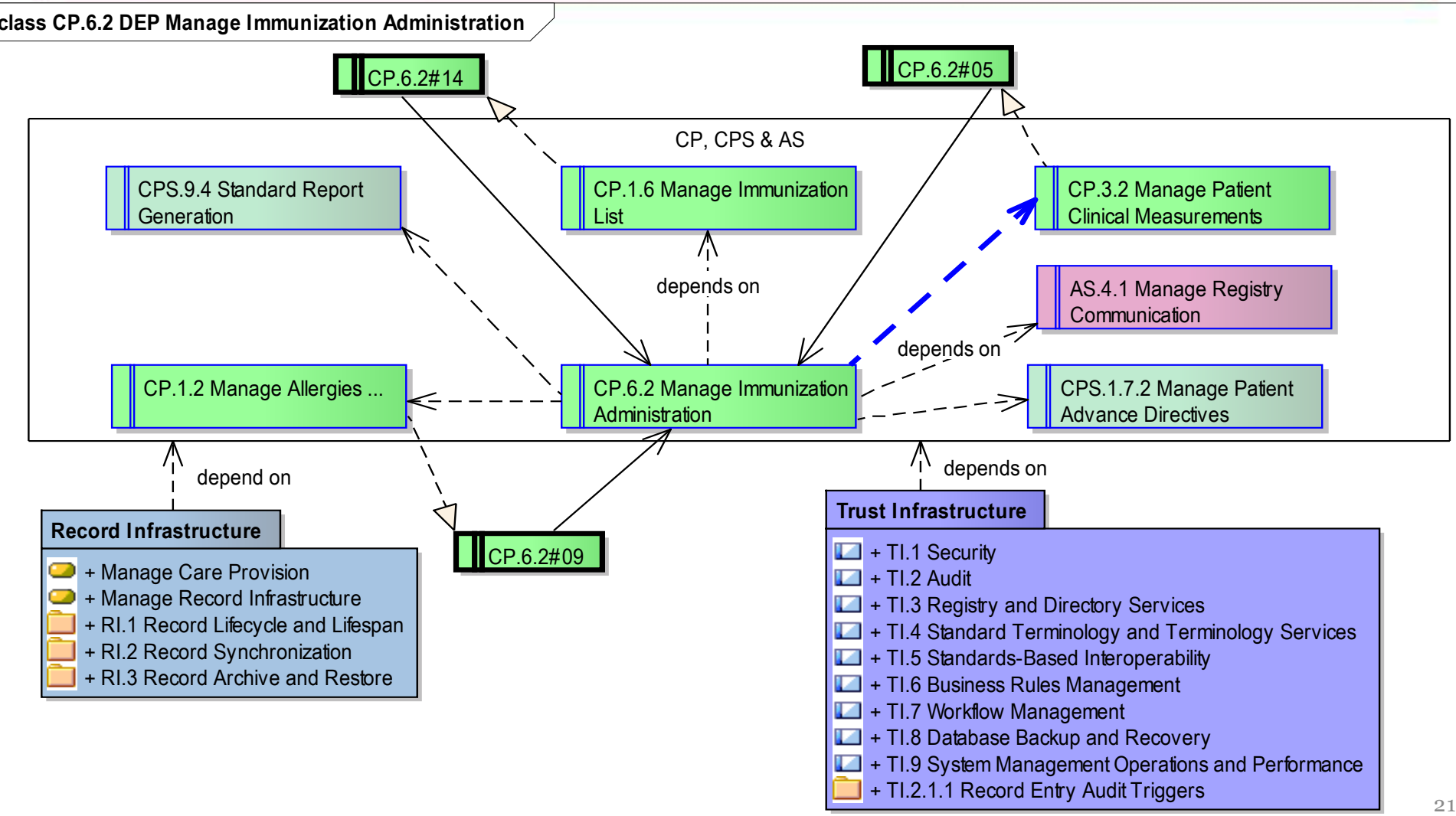
# Example Use-Case Traceability-Analysis

## CP.6.2 Immunization Management Conformance Criteria

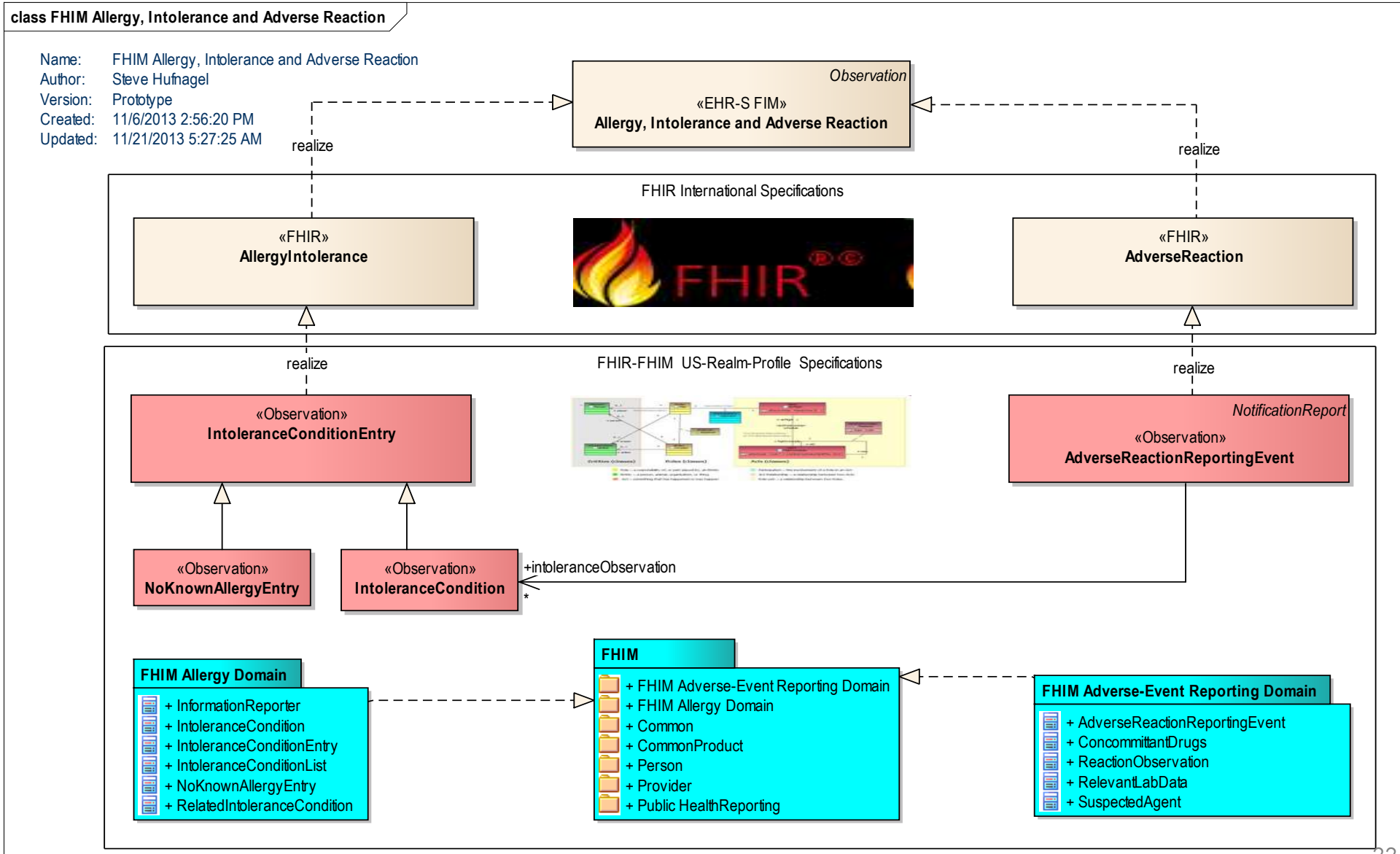
**EHR-S Operations** **CC Bindings** **EHR-S Data-Types & Data-Entities** **Human Entities and Actions**



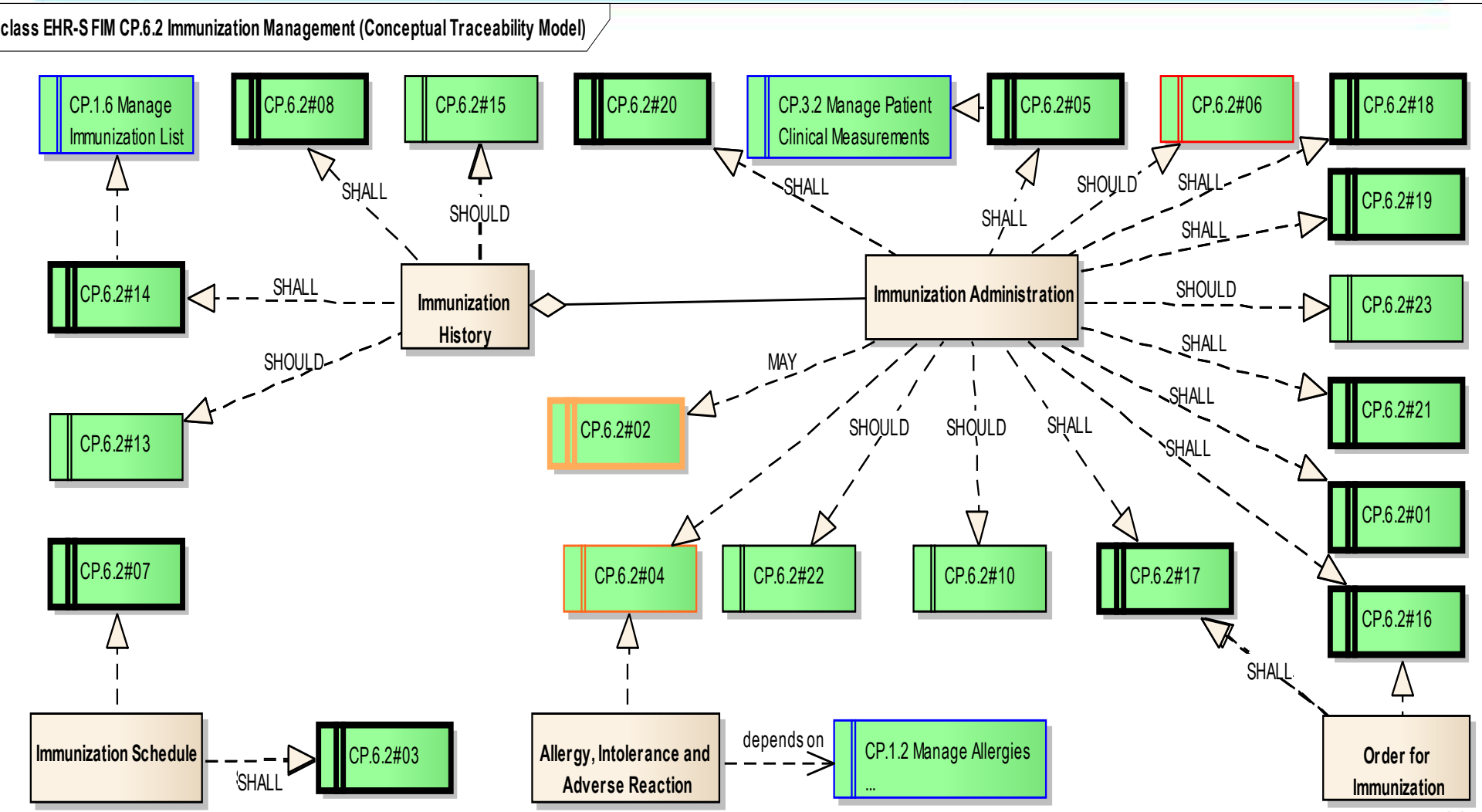
# EHR-S-FIM Dependencies
## CP.6.2 Immunization Management



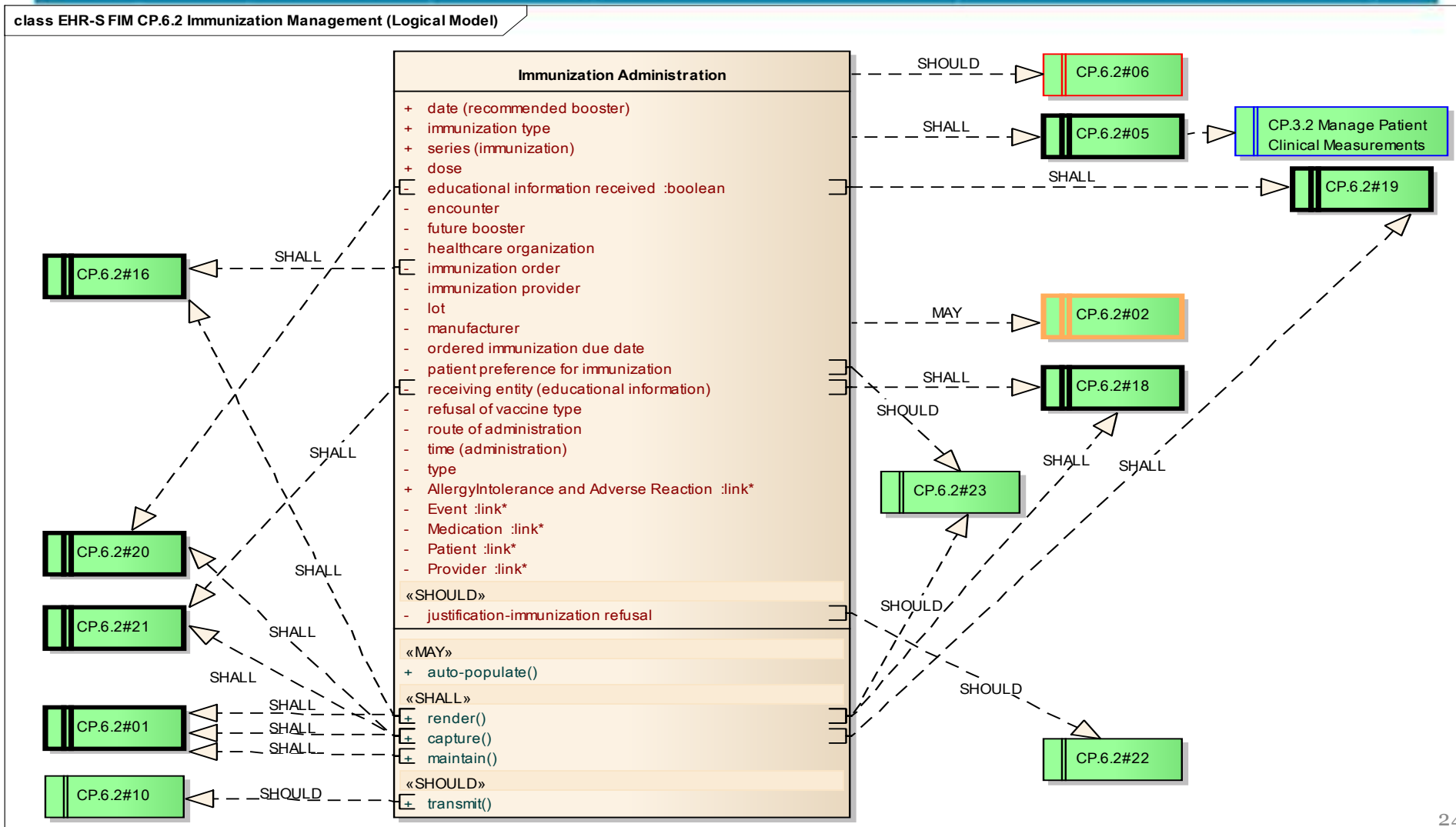
# Example Linkage-to FHIR & FHIM for Allergy, Intolerance & Adverse-Reaction



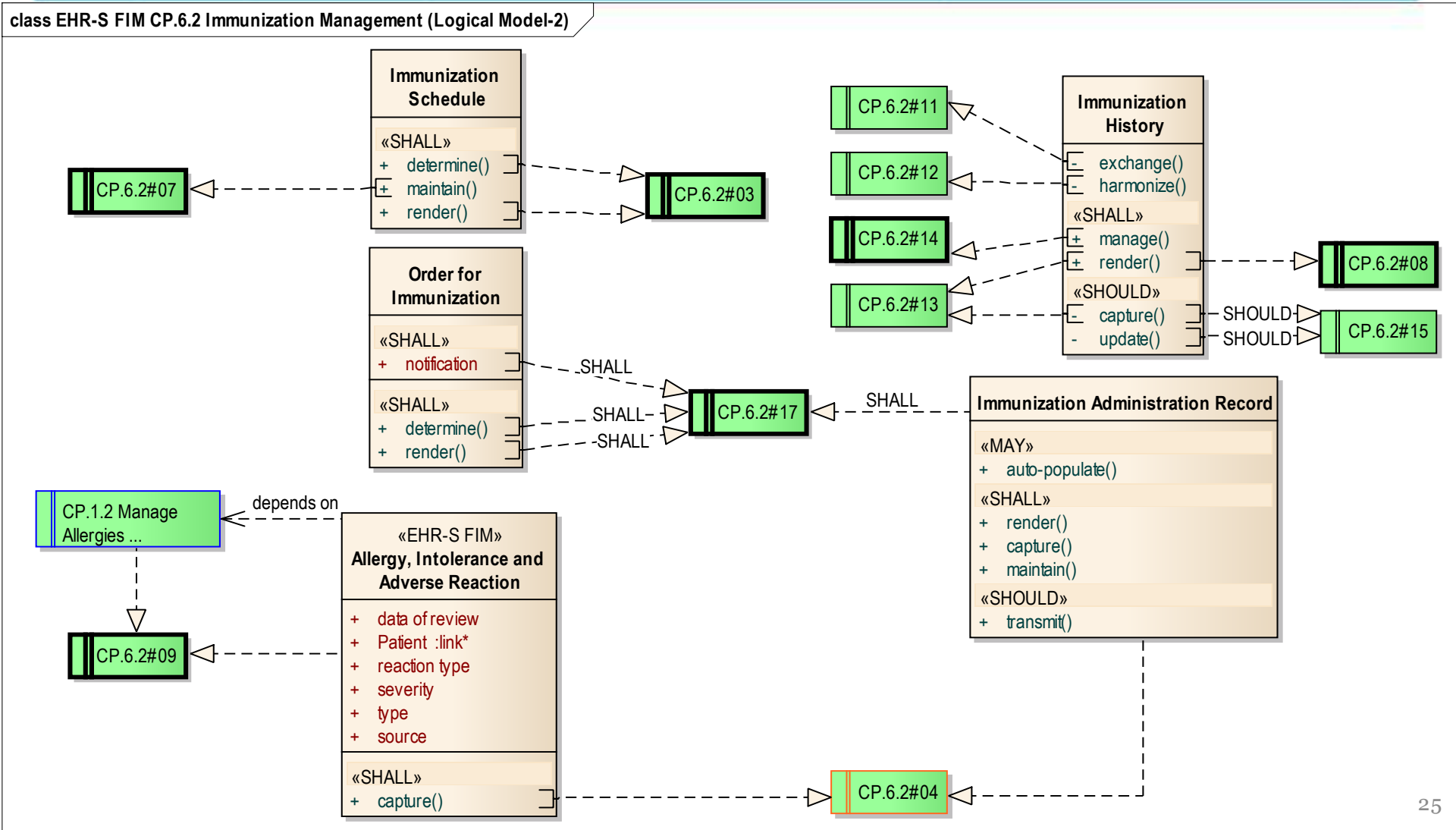
# EHR-S-FIM
# Conceptual Traceability Model
## CP.6.2 Immunization Management



# 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

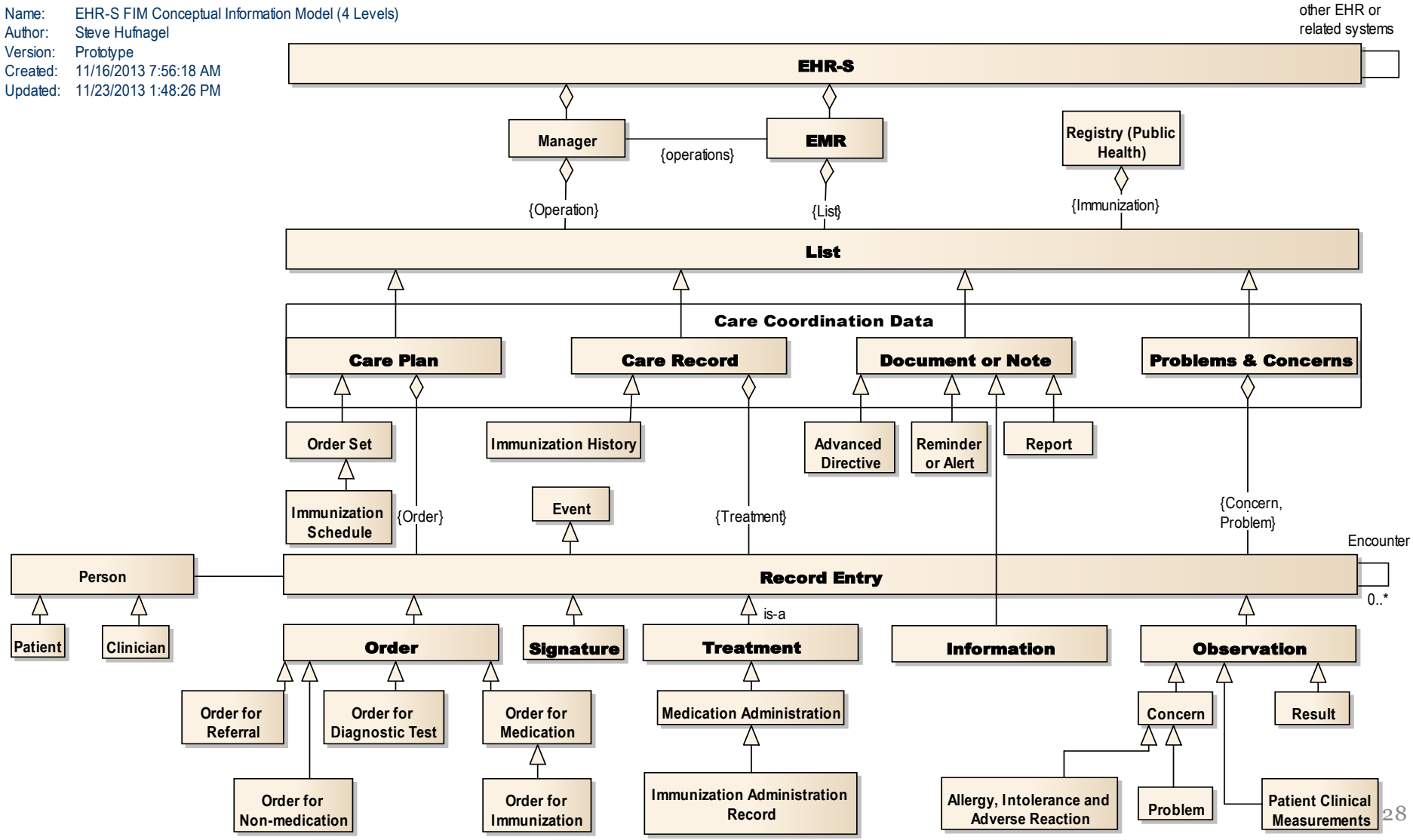
**ISSUE**: Consistency of Conformance Criteria (CC) across related functions, such as Medication-and-Immunization and Orders-and-Results Management.

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.

# EHR-S FIM Anatomy (Structure) Conceptual Information-Model (Level 4)

**ISSUE**: Gora suggests only using aggregation to make the diagram more intuitive

Name: EHR-S FIM Conceptual Information Model (4 Levels)
Author: Steve Hufnagel
Version: Prototype
Created: 11/16/2013 7:56:18 AM
Updated: 11/23/2013 1:48:26 PM



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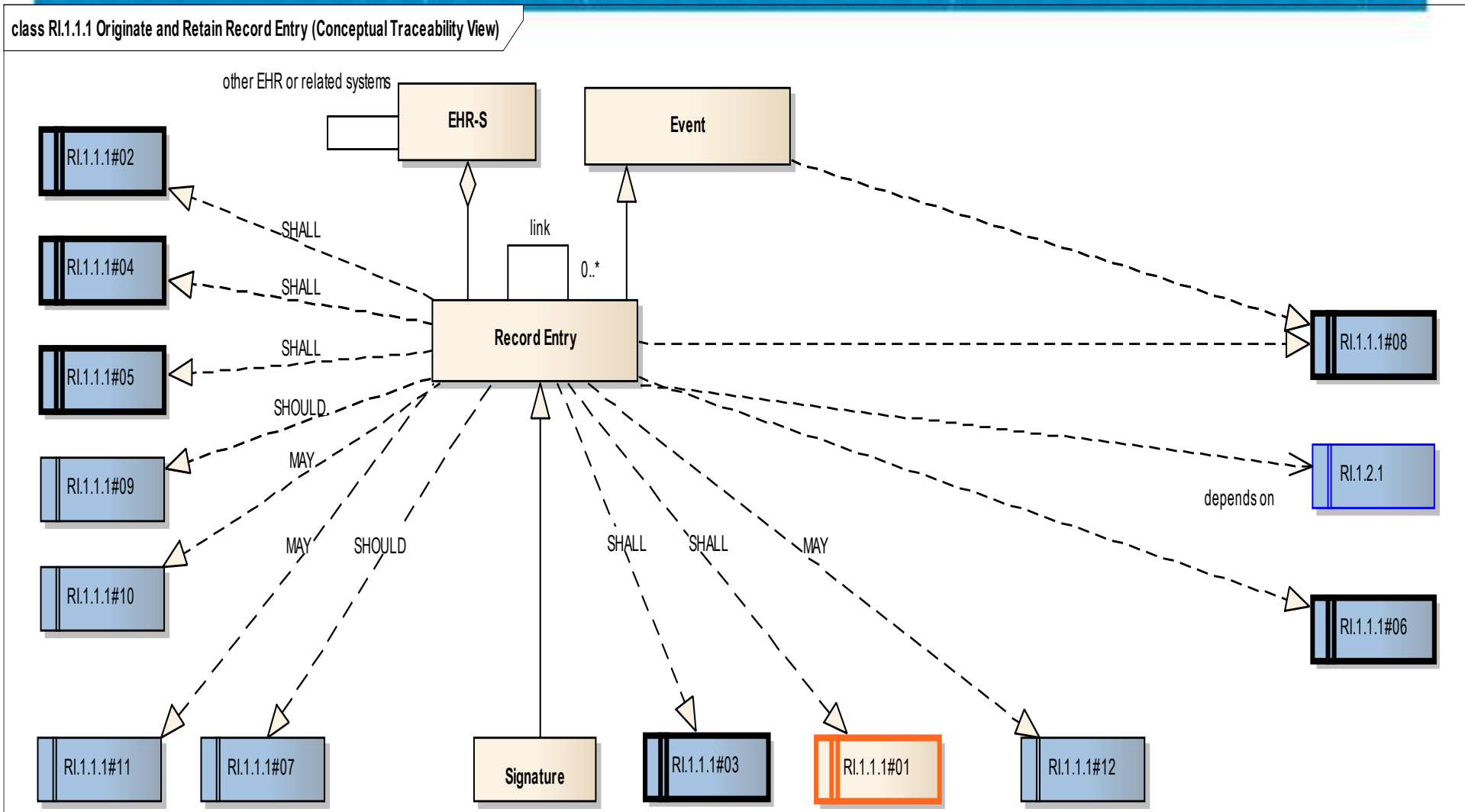
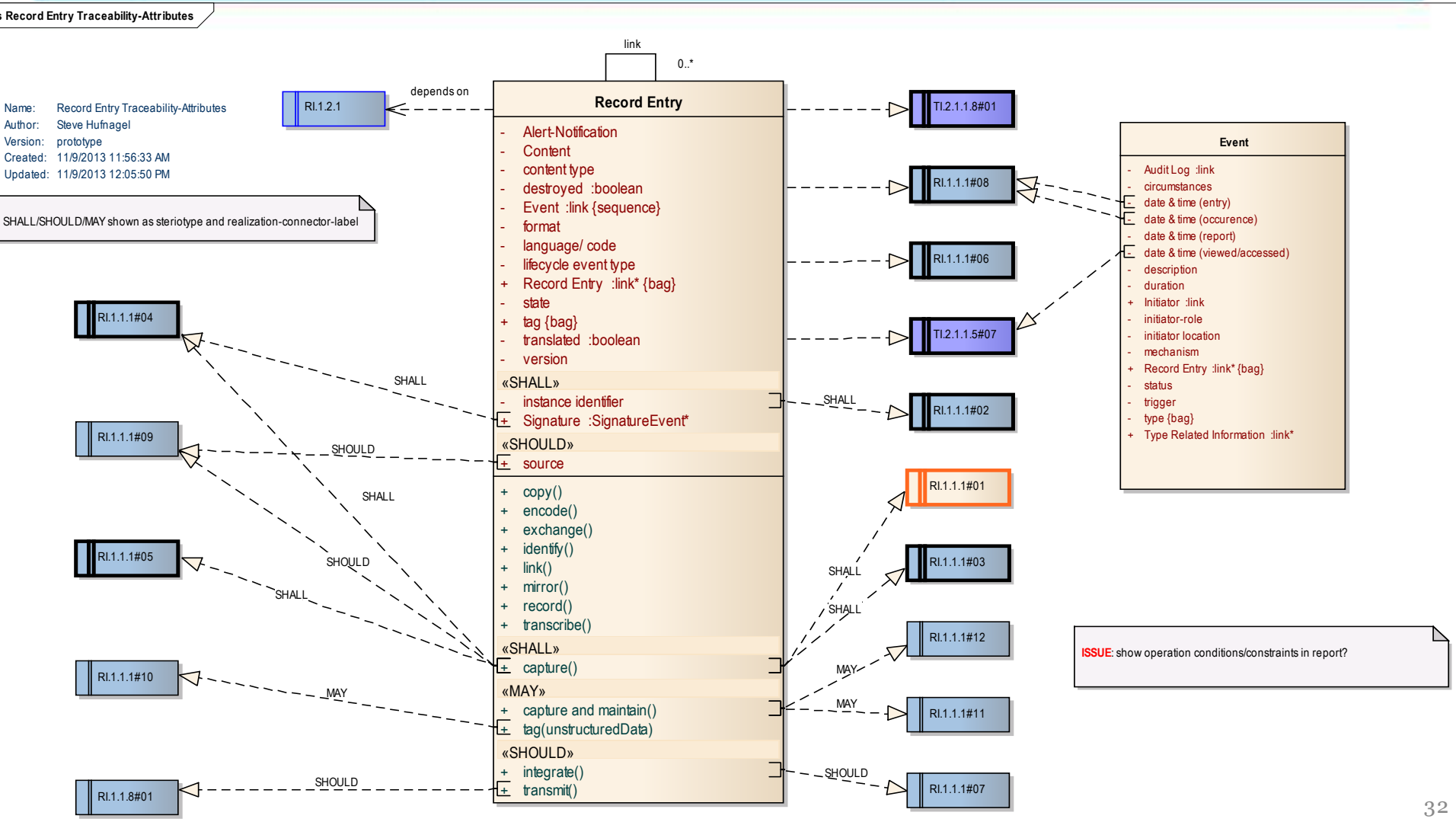
# EHR-S FIM
# Conceptual Information Model (CIM)
## RI.1.1.1 Originate and Retain Record Entry



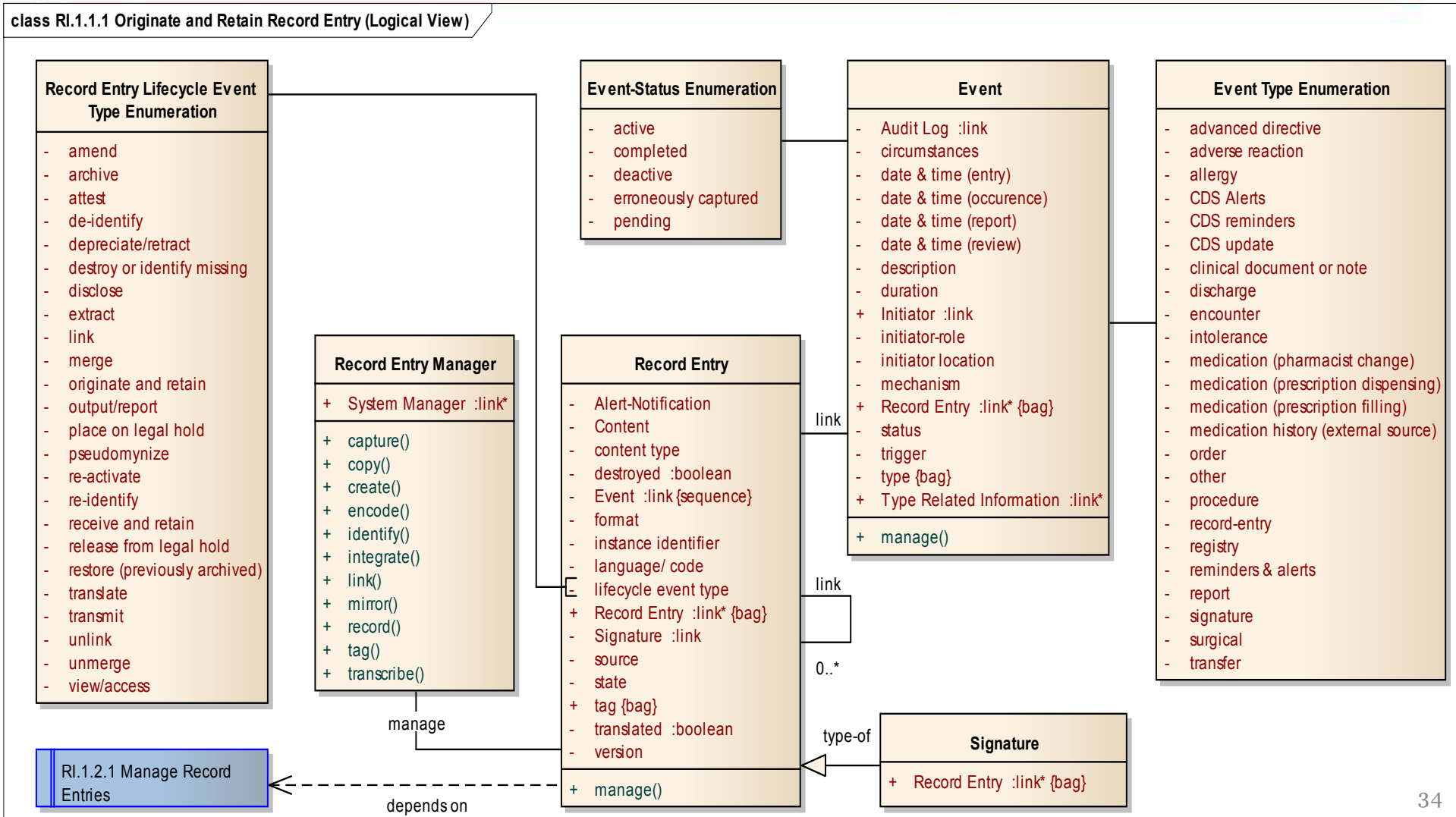
# EHR-S FIM
# Traceability View
## RI.1.1.1 Originate-and-Retain Record Entry



# 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.

# 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-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

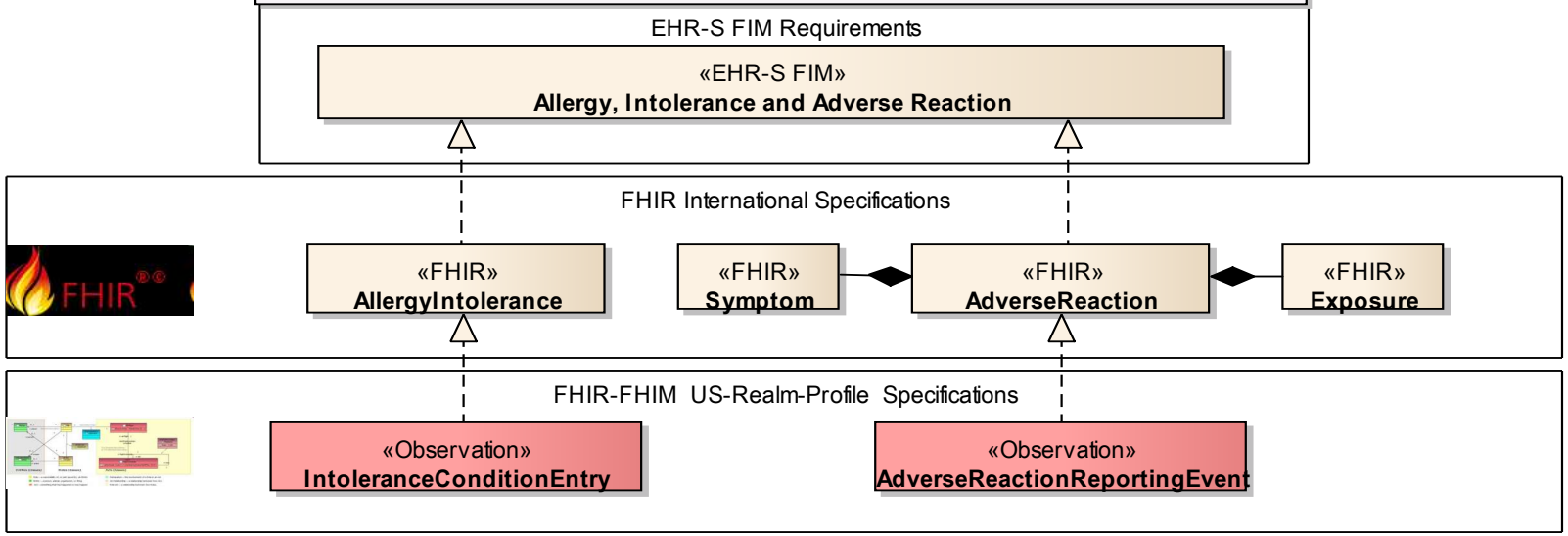
# EHR-S FIM Prototype
# Allergy, Intolerance & Adverse-Reaction
## FIM-FHIR-FHIM Requirements-Specifications

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

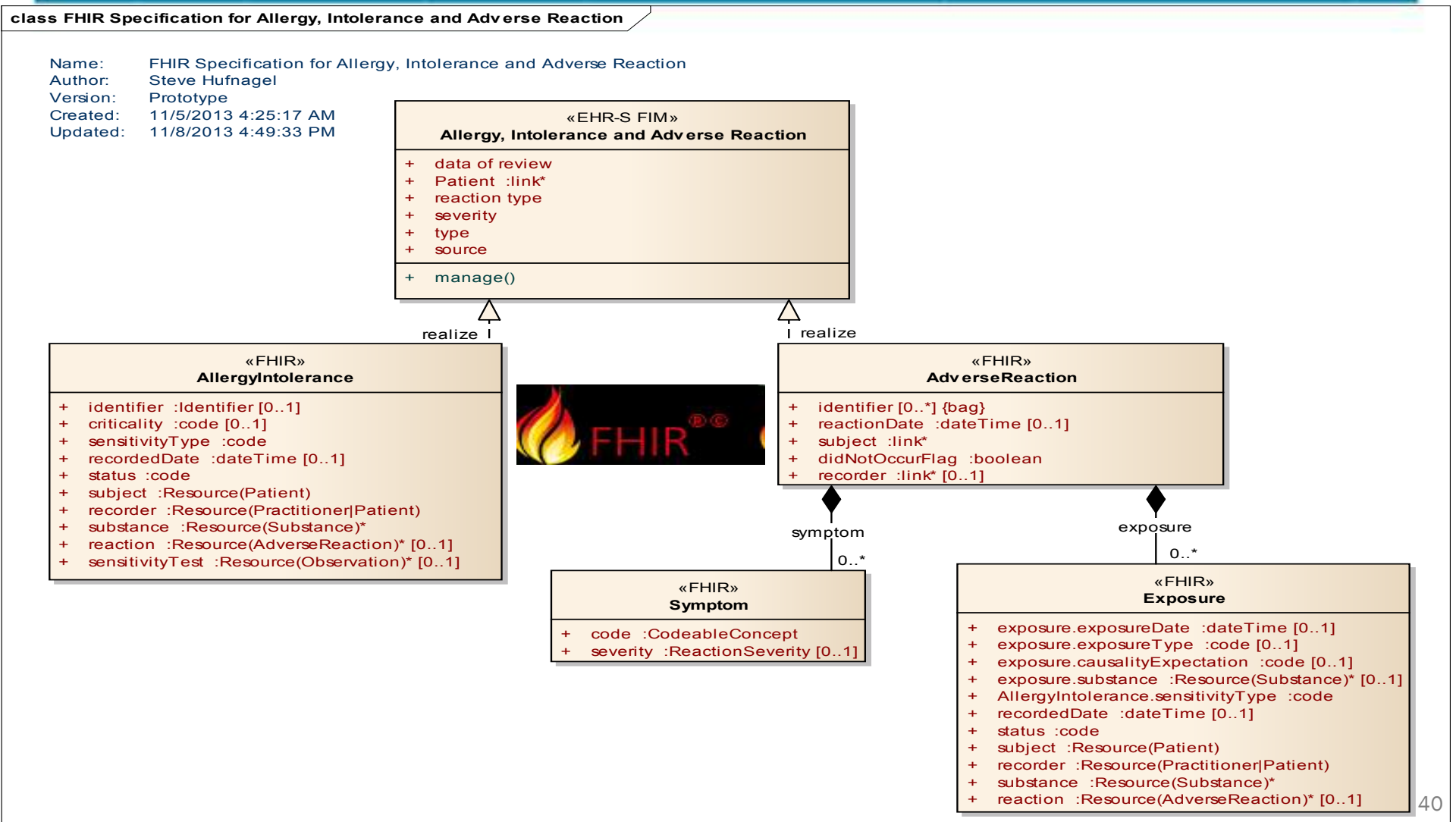
Name: FHIR-FHIM High-Level Specification for Allergy, Intolerance and Adverse Reaction
Author: Steve Hufnagel
Version: Prototype
Created: 11/7/2013 4:26:03 AM
Updated: 11/18/2013 9:07:42 AM

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



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

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

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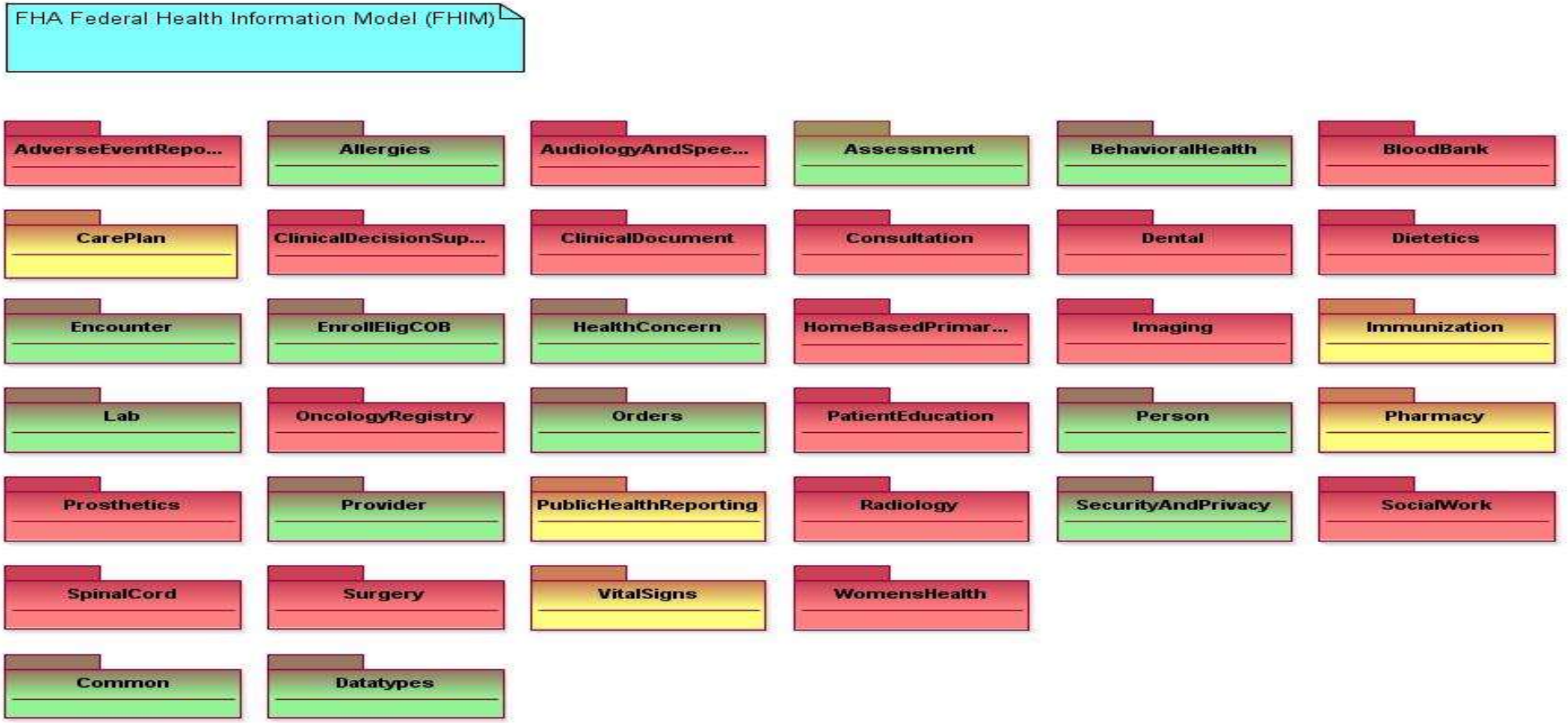
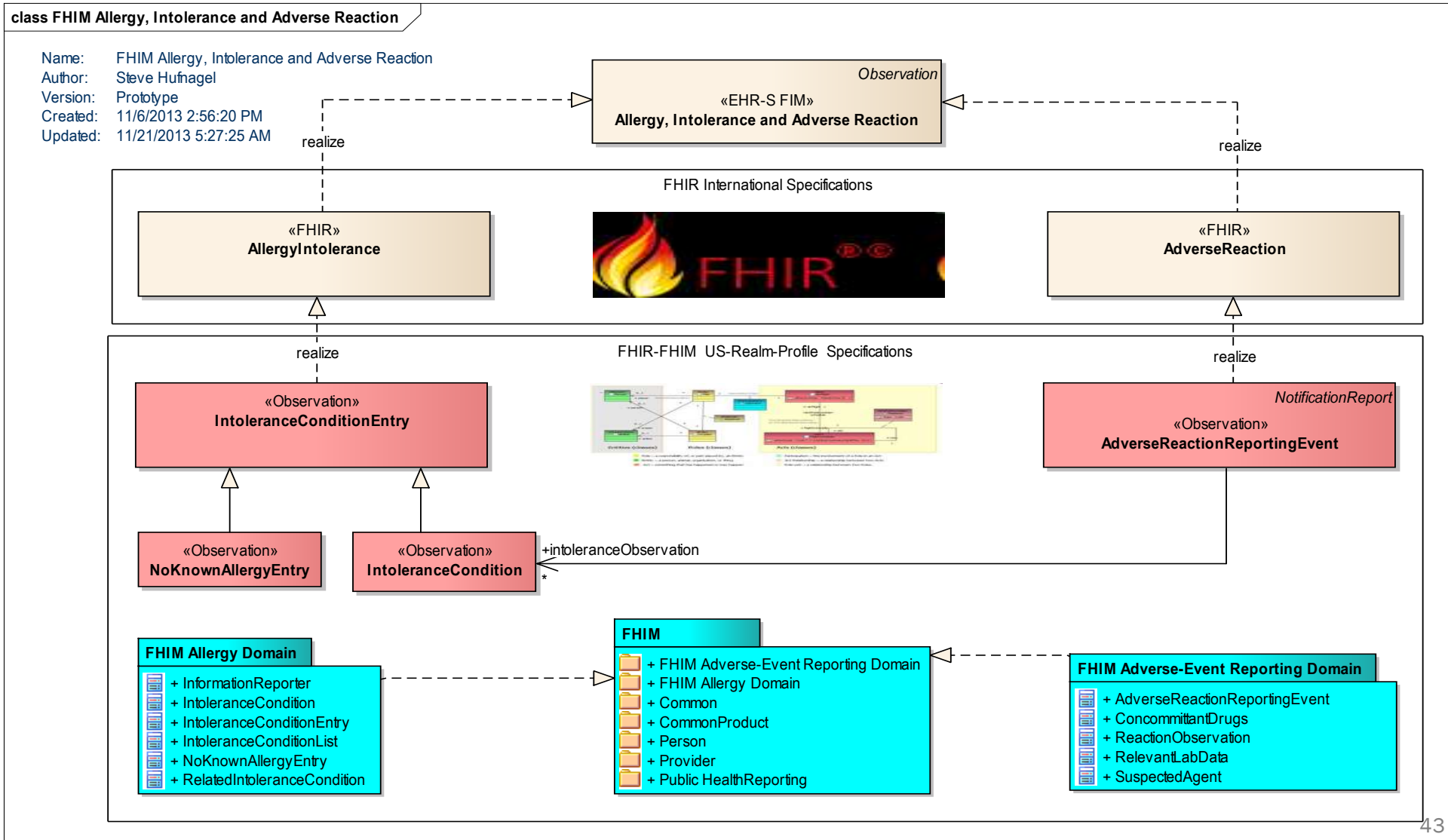
# EHR-S FIM Using Federal Health Information Model (FHIM)

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



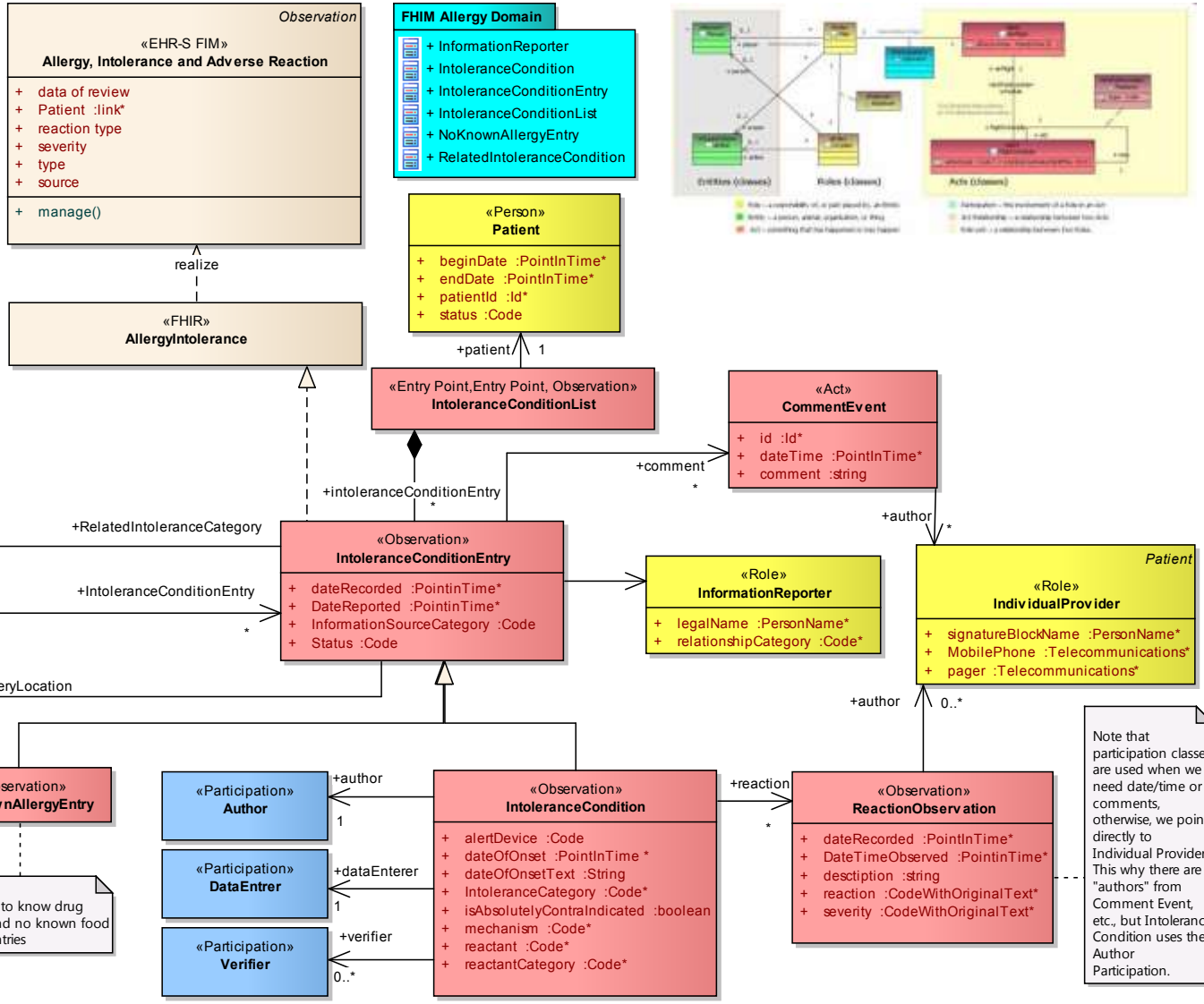
# Prototype
# Allergy, Intolerance & Adverse-Reaction
# FHIM High-Level US-Realm Specification



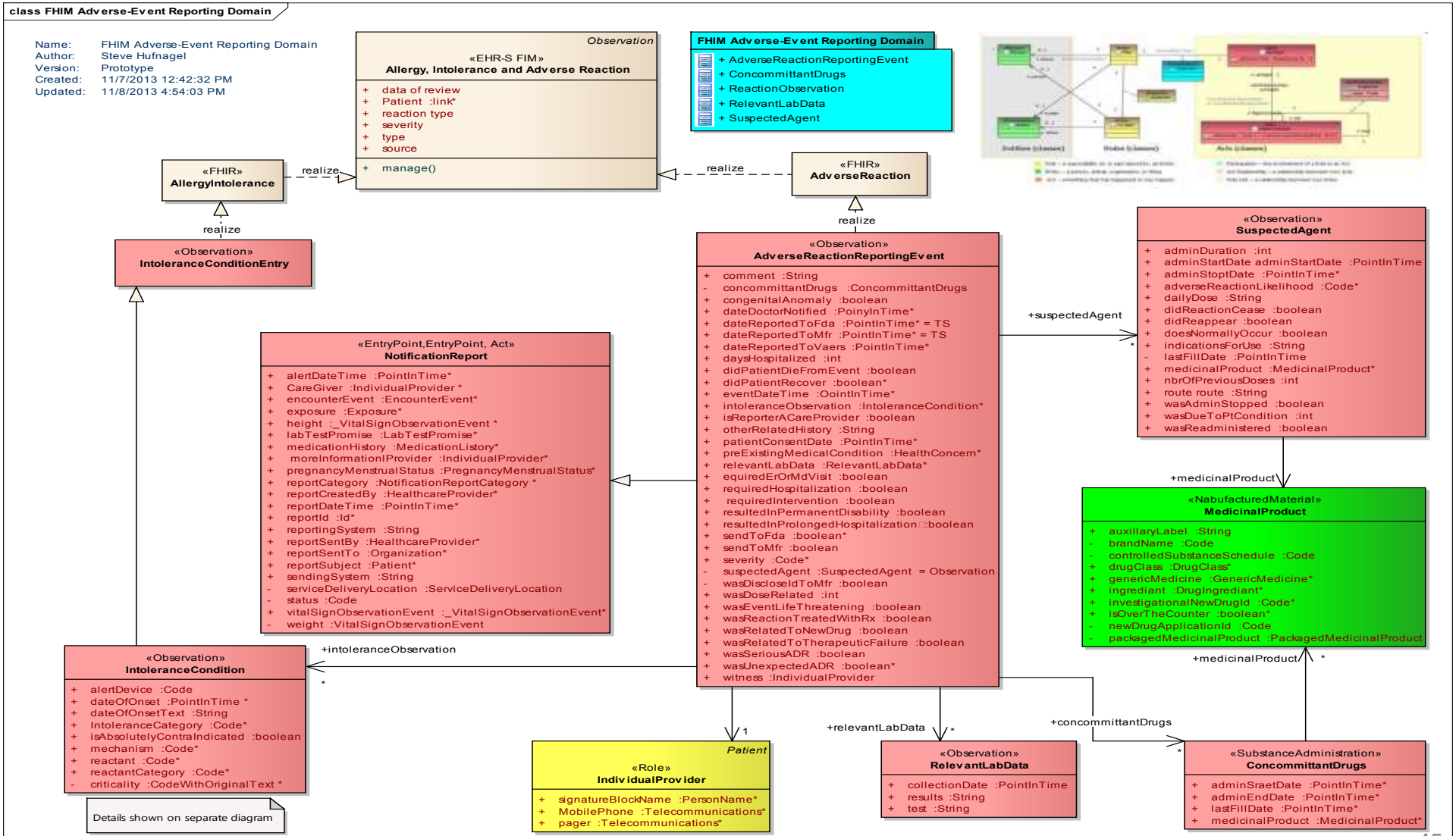
# Prototype
## FHIM-Detailed Allergy & Intolerance Specification

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<br>Import<br>Receive<br>Transmit | Analyze | Decide | De-Identify<br>Hide<br>Mask<br>Re-Identify<br>Unhide<br>Unmask |
| | Archive<br>Backup<br>Decrypt<br>Encrypt<br>Recover<br>Restore<br>Save | Annotate<br>Attest<br>Edit<br>Harmonize<br>Integrate<br>Link<br>Tag | Delete<br>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?.