

EHR-S FM Release-3 Summer Prototype Plan

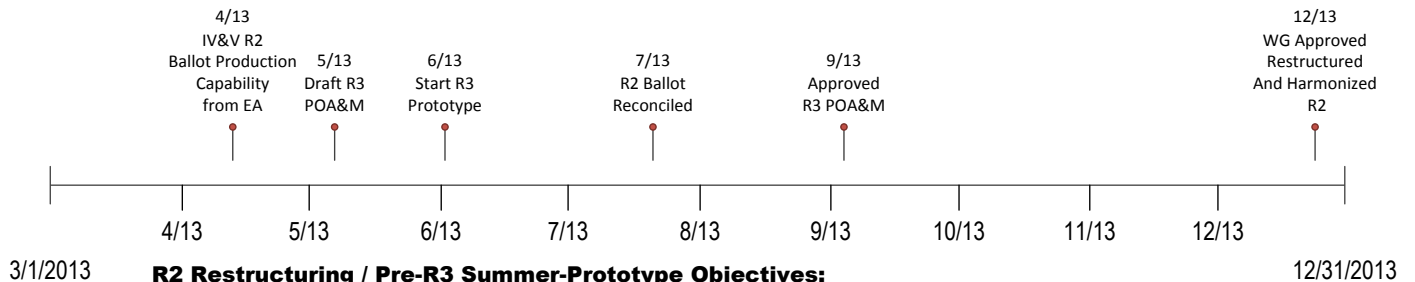
EHR Interoperability WG

To Participate: Call 1-770-657-9270 PC510269# 2 PM every Tuesday

Gary Dickinson, Gora Datta, EHR Interoperability WG Co-chairs

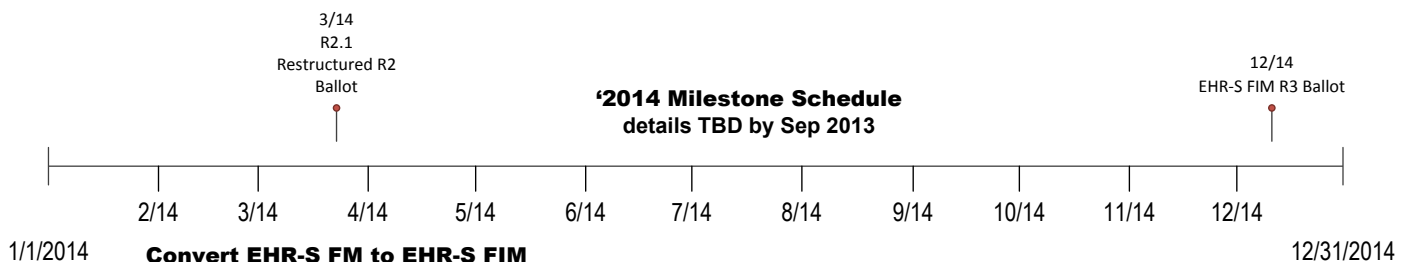
Steve Hufnagel, EHR Interoperability WG Facilitator

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R2 Restructuring / Pre-R3 Summer-Prototype Objectives:

- Investigate EHR-S FM use of Use-Case Simplification approach
 - Standardized Common/managed set of actors/entities/concepts,
 - Common/managed set of Actions/Activities and
 - Common/managed set of requirements / conformance criteria.
- Investigate EA tool capabilities / limitations
 - Investigate EA Ballot Production capabilities/limitations
 - Investigate EA tool reporting capabilities/limitations
 - Recommend EA tool '2014 upgrades
- Investigate R2 restructuring
 - Direct Care, Supportive, Infrastructure pillars
 - Re-categorization of hierarchies within pillars
 - Conformance Criteria Inheritance hierarchies
- MU Profile / Structured Data Capture (SDC) initiative
- PRODUCT: a '2013 ballot-able R2.1 (restructured/harmonized 2.0) and then a Dec '2014 ballot-able EHR-S FIM R3.



Convert EHR-S FM to EHR-S FIM

- Add linking to FHIR modules and remove data element conformance criteria from EHR-S FM
- In infrastructure, add Core EHR-S function with event, list, document, communications managers
- Remove SHALLS/SHOULD/MAYS; where, profiles can add SHALLS/SHOULD/MAYS
- Convert all verbs to manage; where, profiles can restrict within the verb hierarchy.
- Create US-Domain MU-profile to verify and validate the core EHR-S FIM and EA tool's ability to manage profiles

1.0 EHR-S Release 2 Issues and Proposed Mitigations

Following are the proposed EHR-S FM R2 issues and mitigations. (Bold indicates issue(s))

- Baseline** - EHR-S FM R2.0 is the baseline (May/Sep 2013 ballot) for R3.
- Name** - EHR-S FM will be renamed EHR System Function and Information Model Reference Architecture (EHR-S FIM RA-3.0)
- Tool** - EHR-S FIM R3.0 Reference and Profiles will be Sparx EA tool based, which will

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1. Expedite the ballot / profile processes (MAX and then from MAX to PDF, Word, XML, XDS)
 2. Create Excel comment sheet
 1. flatten inheritance hierarchies and Conformance Criteria (**CC**) / requirements links
 3. Create Ballot Production
 4. Create useful System, Sub-system and/or Capability and appropriate Interoperability-Specification reports
 5. Provide exports, which are usable by design, Implementation and test/certification tools.
4. **R2 Deficiencies** - EHR-S FIM R3.0 will address the following R2.0 deficiencies
1. **Example Use-Cases / Scenarios** - will be addressed by incorporating / formalizing “S&I Framework Use-Case Simplification Tool” concept into the Sparx EA Tool version of the model
 1. Standardized¹ common/managed set of actors/entities/concepts,
 1. their data elements
 2. their data dictionary definitions,
 2. Standardized common/managed set of Actions/Activities and their ICOMs:
 1. **I**nput entities
 2. **C**ontrols
 3. **O**utput entities
 4. **M**echanisms
 3. Common/managed set of requirements / conformance-criteria.
 4. Domain-specific profile’s context, defined by metadata tags and/or assertions,
 1. Create US Realm “Meaningful Use Profile” as exemplar
 2. Integrate “Use-Case Simplification Tool” [US Realm S&I Framework as exemplar] into Sparx EA
 3. **REQUEST**: Please identify other exemplar profiles you wish to contribute.
 5. Use-case events/actions mapped to EHR-S functions and FHIR information resources (FHIR described below)
 2. **EHR-S FM R2 is hard to navigate**; that is, it is not intuitive
 1. Leverage ‘2003 IOM Key EHR Capabilities & ‘2011 National Quality Strategy Priorities (7 categories)
 1. Decision Support, Results Management, Order Entry/Mgmt./CPOE, Administrative Processes, Patient Support/Education
 2. Health Information and Data, Reporting & PopHealth Mgmt. , Communication and Connectivity
 3. Be careful to not be US specific
 2. Move “Records Infrastructure” under “Infrastructure”
 3. Move “Trust Infrastructure” under “Infrastructure”
 3. **EHR-S FM R2 is Inconsistent and Too Complex**; resulting in, it being hard to use
 1. There are too many and inconsistent conformance criteria
 1. Create CC inheritance hierarchy within tool (e.g., CC for orders vs. at pharmacy or lab level)
 2. Manage CCs as numbered requirements (e.g., 0037CC)
 2. Remove conformance criteria for data elements
 1. Add normative Information Model
 1. Associate EHR-S Function to FHIR
 2. Associate EHR-S Functions with Detailed Clinical Models (DCMs) / CIMI models (e.g., pulse, temperature) to specify data elements, metadata tags (e.g., who, what, when, where, how) to define context, data element sets, and DCM compositions (e.g., blood pressure or vital signs).

¹ ISO 13940 Continuity-of-Care System-of-Concepts and Glossary.

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2. Map IOM/NQSP clinical domains, Domain Analysis Models (DAMs) and DCMs / FHIR modules to EHR-S functions for MU in US realm exemplar profile.
3. Inconsistent Verb use (e.g., render, print, capture, save)
 1. Functions use the manage verb → remove conformance verb criteria for system operations/methods (e.g., render, print, capture, save) and move EHR System under infrastructure.
 1. Add Core EHR within Infrastructure
 1. Event and associated data Manager, List manager, Document manager
 2. Registry manager, Repository manager
 2. Profiles can refine sub-manage verbs from verb hierarchy
 2. In the phase 2 tool, expand the current validator with these new functions and rules.
4. Replace SHALL/SHOULD/MAY qualifiers with “according to scope of practice, organizational policy, or jurisdictional law.”
 1. Add SHALL/SHOULD/MAY qualifiers within profiles (e.g., domain and realm, such as ED in Holland)
4. **Incomplete / Inconsistent “see also”** indicators
 1. Include “see also” in Direct Care & Supportive Care; but, not infrastructure; distinguish
 1. Dependencies, inheritance, aggregation, composition
 2. Associations (“see also”)
5. **Information Model** – R3 will remove incomplete/inconsistent data-element requirements/conformance-criteria; and, R3 will link functions to The HL7 Virtual Patient Record (VPR) and/or Health informatics - Electronic Health Record Communication (**EN 13606**), which defines a rigorous and stable information architecture for communicating part or all of the Electronic Health Record (EHR) of a single subject of care (patient); where, Information Exchanges (IEs) and the appropriate IE Fast Healthcare Information Resources (**FHIR**), Detailed Clinical Models (**DCMs**), Domain Analysis Models (**DAMs**) and MAX publications.
6. **Functional Updates** – This initiative does NOT plan to make functional changes, beyond minor editorial updates which are discovered while making the proposed structural changes. Concurrent with this effort, functional analysis and updates may be made by the main EHR WG and will be coordinated with this effort.

2.0 EHR-S FIM R3 RA Vision aka Concept of Operations (CONOPS) Use Cases

1. An analyst at a US federal agency wishes to specify a History-and-Physical (H&P) clinic capability, which does immunizations:
 - a. The Sparx EA-tool based "Reference EHR-S FIM" is opened
 - b. The US Domain / Meaningful-Use Profile is selected
 - c. The Mobile-Device Profile is selected
 - d. The low-Income/Third-World Country Profile is selected
 - e. Ms. Analyst builds a use-case using the Reusable Use-Case Events, Entities and Activities. This use case is created:
 - i. A patient is registered in a Clinic
 1. The system queries the patient registry
 2. The patient's demographic information is reviewed and updated
 3. A appointment is scheduled
 - ii. The patient is checked in for the H&P
 1. The patient's social history is taken by the receptionist
 - iii. The clinicians "system" is cached with the patient's electronic medical record
 - iv. An encounter occurs with a clinician
 - The patient's medical history is taken
 - The patient's physical exam is given
 - The patient's is brought up to date on immunizations
 - Immunization history is checked
 - Allergies and adverse reactions are checked
 - Needed immunizations are given
 - Immunization history is updated
 - Adverse reactions are documented
 - Medications are prescribed
 - Diagnostic Tests are ordered
 - As needed, consults are ordered
 - The patient's Electronic Medical Record (EMR) is updated and sent to an EMR repository
 - v. The Patient's PHR is updatedThe patient is discharged from the clinic
 - vi. Diagnostic test results and consult reports are received and reviewed
 - vii. The patient is requested to have one-or-more follow up visit(s)
 - viii. The episode of care is closed.
 - f. The EHR-S FIM tool is used to create a "domain specific" profile for H&P with Immunization capability supporting requirements-specification for an acquisition, development, test, and/or certification, according to scope of practice, organizational policy, or jurisdictional law.
 - i. EHR-S Functions
 - ii. EHR-S Information exchanges mapped to
 1. Fast Healthcare Information Resources
 2. Standards Profile
 - iii. SHALL, SHOULD, MAY determination
 - iv. Meaningful Use objectives
 - v. Requirements, test and certification specifications.
2. An engineer at a Canadian federal agency wishes to specify a History-and-Physical (H&P) clinic capability, which does immunizations:
 - a. The Sparx EA-tool based "Reference EHR-S FIM" is opened
 - b. The Canadian Domain / Health-Factors Profile is selected
 - c. The Mobile-Device Profile is selected

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- d. The low-Income/Third-World Country Profile is selected
- e. Ms. Engineer selects the functions and/or FHIR modules desired within the capability. :
 - i. Details are TBD
- f. The Tool identifies potential Use Case Events and confirms their respective applicability.
 - i. The Tool creates a function-FHIR matrix and confirms their respective applicability
 - ii. The Tool identifies unspecified dependencies and associations and confirms their applicability.
- g. The EHR-S FIM tool creates H&P with Immunization capability requirements-specification for an acquisition, development, test, and/or certification, according to scope of practice, organizational policy, or jurisdictional law.
 - i. Use Case Events, Actions and Constraints
 - ii. EHR-S Functions
 - iii. EHR-S Information exchanges
 - 1. Fast Healthcare Information Resources
 - 2. Standards Profile
 - iv. SHALL, SHOULD, MAY determination
 - v. EHR-S Information exchanges are identified for the functions
 - 1. Fast Healthcare Information Resources
 - 2. Standards Profile