Advanced EHR-S Functional Model and Standard: Profiles Against the EHR & PHR System Functional Models

Presented by:

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Agenda

- Recap of the EHR-S Model and Intro to PHR-S FM
- Review of key conformance-related concepts
- Review of EHR-S Conformance Chapter & How To Process
- Summary of current and in-process Profiles
EHR-S Functional Model & Standard

- **Normative (ANSI standard):** Function names, statements & conformance criteria provide a reference list of functions that:
  - May be present in an EHR-S
  - Understandable from a user’s perspective
  - Enables consistent expression of functionality

- **Reference (not balloted):** Profiles (provide use cases for further explanation or understanding), How-To Guide, Glossary, Function Descriptions
### EHR-S Functional Model at a Glance

- **Direct Care**
  - C1.0 Care Management
  - C2.0 Clinical Decision Support
  - C3.0 Operations Management and Communication

- **Supportive**
  - S1.0 Clinical Support
  - S2.0 Measurement, Analysis, Research, Reporting
  - S3.0 Administrative and Financial

- **Information Infrastructure**
  - I 1.0 EHR Security
  - I 2.0 EHR Information and Records Management
  - I 3.0 Unique identity, registry, and directory services
  - I 4.0 Support for Health Informatics & Terminology Standards
  - I 5.0 Interoperability
  - I 6.0 Manage business rules
  - I 7.0 Workflow

**Functions describe the behavior of a system in user-oriented language so as to be recognizable to the key stakeholders of an EHR System.**
# Care Setting Profiles-Variable Functions

## Inpatient
- Medication Administration Record
- Bed management

## Outpatient
- Wellness Reminders

## Home
- Medication Administration Record
- Lifestyle

### Table

<table>
<thead>
<tr>
<th>Inpatient</th>
<th>Outpatient</th>
<th>Home</th>
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<tbody>
<tr>
<td>Medication Administration Record</td>
<td>Wellness Reminders</td>
<td>Medication Administration Record</td>
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<tr>
<td>Bed management</td>
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<td>Lifestyle</td>
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<th>Drug-Drug Interactions</th>
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<td>Results Reporting</td>
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<td>Order Management</td>
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<tr>
<th>Demographic Management</th>
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<td>Record Management</td>
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Conformance to Profiles

Implementations

EHR-S

derived profile

profiles

define your own

Profiles

EHR-S

profile

EHR-S

profile

EHR-S

profile

functions

criteria

rules for profiles

EHR

Functional

Model

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**PHR-S Functional Model at a Glance**

<table>
<thead>
<tr>
<th>Personal Health</th>
<th>Supportive</th>
<th>Information Infrastructure</th>
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</thead>
<tbody>
<tr>
<td>PH.1.0 Account Holder Profile</td>
<td>S.1.0 Provider Management</td>
<td>IN.1.0 Health Record Information Management</td>
</tr>
<tr>
<td>PH.2.0 Manage Historical Clinical Data And Current State Data</td>
<td>S.2.0 Financial Management</td>
<td>IN.2.0 Standards Based Interoperability</td>
</tr>
<tr>
<td>PH.3.0 Wellness, Preventive Medicine, and Self Care</td>
<td>S.3.0 Administrative Management</td>
<td>IN.3.0 Security</td>
</tr>
<tr>
<td>PH.4.0 Manage Health Education</td>
<td>S.4.0 Other Resource Management</td>
<td>IN.4.0 Auditable Records</td>
</tr>
<tr>
<td>PH.5.0 Account Holder Decision Support</td>
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<tr>
<td>PH.6.0 Manage Encounters with Providers</td>
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</table>

Draft Standard of functions to describe the behavior of a system in plain language so as to be recognizable to the key stakeholders of a PHR System.
PH.2.5 Manage Current State Data Set

PH.2.5.3 Manage Test Results

Statement/Description: Capture, maintain and present the results of diagnostic tests including inpatient, ambulatory and home-monitoring tests.

Example: The results reporting list will display when the most recent EKG was done or ….

1. The system SHALL provide the ability to filter results by factors that supports results management, such as type of test and date range.
2. The system SHOULD indicate normal and abnormal results depending on the data source.
3. The system SHOULD provide the ability to filter lab results by range …
4. The system SHOULD display numerical results in graphical form and allow …. 
5. The system SHALL provide the ability to group tests done on the same day.
6. The system SHOULD trigger decision support algorithms from the results
7. IF the system contains the electronic order, THEN the results SHOULD be linked to a specific order.
8. The system SHALL provide the ability for account holders to annotate a result.
9. The system MAY display a link to an image associated with results.
Agenda

- Recap of the EHR-S Model and Intro to PHR-S FM
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- Review of EHR-S Conformance Chapter
- Summary of current and in-process Profiles
Review of Conformance Concepts

The basics:

- Motivation – why care about conformance
- Definitions
- EHR-S FM Conformance Clause
Motivation

- What does it mean to “claim conformance”?  
  - Profiles, EHR system?
- What do they actually conform to?
- What criteria (requirements) are met?
  - Conformance Clause.
- How can a conformance claim be verified?
  - Test suites, test tools, testing and certification
Definitions: Fitting it all together

Certification
qualified bodies to do the testing and certification
control board - advisory and arbiter

Validation
Process - policy and procedures for testing

Conformance Testing
Test suite, Test tool
(test software, test scripts, test criteria)

Profile
Standard
Conformance clause, conformance criteria

We are concerned with

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Agenda

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EHR-S FM Chapter 2: Conformance Clause

- Normative chapter
- Defines conformance to the Functional Model
- Contents:
  - Concepts – conformance, profiles, derived profiles
  - Structure of the FM
  - Normative language
  - Priorities
  - Conformance Criteria
  - Rules for profiles
  - Reference materials:
    - Example use cases, sample conformance clauses
    - Interpreting and understanding ‘dependent shall’ criteria
    - Definitions
EHR-S FM Conformance Clause

- Normative Language – keywords
  - SHALL: Mandatory requirement (‘is required to’)
  - SHOULD: Optional, recommendation (‘is encouraged’)
  - MAY: Optional, permissible action (‘is permitted’)
  - Some profiles have added:
    - SHALL NOT – indicates a prohibited action (‘prohibited’)

- Priorities –
  - Assigned by profile to each function
  - Timing of when a function gets implemented by the system
  - 3 priorities
    - Essential Now (EN) – implementation of function is mandatory
    - Essential Future (EF) – optional now, mandatory at some time in future
      - Profile defines the time frame (date, time allotment, event)
      - Multiple time frames (e.g., EF-2008, EF-2009)
    - Optional (O)
Overview of Profile Rules

- Highlights of Chapter 2’s profile rules
  - Section 4 Conformance criteria
  - Section 5 Structure
  - Section 6 Functional profile conformance
    - Section 6.1.1 SHALL rules
    - Section 6.2.1 MAY rules
    - Section 6.2.3 SHALL NOT rules
    - Section 6.2 rules for creating new functions
    - Section 6.3 rules for derived profiles
Overview of Profile Rules (continued)

Profiles claiming conformance SHALL for each function:  
(6.1.1#4, #5, #6)

- Indicate its priority: Essential Now (EN), Essential Future (EF), Optional (O)
- Include criteria
  - Inherit any ‘SHALL’ criteria from FM’s function
  - NOT change a FM ‘SHALL’ criterion to ‘SHOULD’ or ‘MAY’
  - Make at least 1 criterion mandatory (‘SHALL’)
  - Copy any ‘Dependent SHALL’ criteria and adhere to rules (*more on this later*)
    - (a special type of criteria, with its own set of rules)

Profiles claiming conformance MAY for each function:

- Adapt applicable FM criteria to match needs of profile (6.1.2)
  - Make it more specific or constrained
  - Change ‘SHOULD’ or ‘MAY’
  - Add new criteria

- FM SHALL always remains as a SHALL in the profile
- FM SHOULD can
  - remain as a SHOULD in the profile
  - be changed to a SHALL or MAY in the profile
  - be omitted from the profile
- FM MAY can
  - remain as a MAY in the profile
  - be changed to a SHALL or SHOULD in the profile
  - Be omitted from the profile
Examples

- **Emergency Dept IS Profile**
  - Added new children functions

  - EDIS Registration
    - DC 1.1.2.1
    - DC 1.1.2.2
    - DC 1.1.2.3
  - Quick Registration
  - ED Merge Registration

  Manage Patient Demographics

- **Child Health Profile**
  - Added new criteria

  - DC 1.1.2

Manage Patient Demographics

**New Criteria**

- If required by the scope of practice, THEN the system SHALL capture time of birth, down to the minute, and date of birth.
- The system SHALL provide the ability to indicate that a patient’s gender is unknown.
- The system MAY provide the ability to compute post-conceptional age for the purposes of decision support.
DC1.8.4 Manage Patient Clinical Measurements

1. IF required by the scope practice, THEN the system SHALL capture patient vital signs such as blood pressure, temperature, heart rate, respiratory rate, and severity of pain as discrete elements of structured or unstructured data.

2. IF required by the scope of practice, THEN the system SHALL capture psychiatric symptoms and daily functioning as structured or unstructured data.

3. The system SHOULD capture other clinical measures such as peak expiratory flow rate, size of lesions, oxygen saturation, height, weight, and body mass index as discrete elements of structured or unstructured data.

4. The system SHOULD compute and display percentile values when data with normative distributions are entered.

5. The system MAY provide normal ranges for data based on age and other parameters such as height, weight, ethnic background, gestational age.

6. The system SHALL document both the time the vital sign was record as well as the time the vital sign was entered into the system.

7. The system SHOULD display trends of vital signs.

8. The system SHOULD provide a means for automated capture and recording of vital signs via external devices.
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# Summary of current & in-progress Profiles (Mar 2009)

<table>
<thead>
<tr>
<th>Profile Name</th>
<th>Sponsor</th>
<th>Status</th>
<th>Type</th>
<th>Realm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Department Information Systems (EDIS)</td>
<td>American College of Emergency Physicians</td>
<td>Registered</td>
<td>Care setting, Specialty (emergency medicine, emergency nursing)</td>
<td>US</td>
</tr>
<tr>
<td>Records Management and Evidentiary Support</td>
<td>ASPE, AHIMA, NCPDP</td>
<td>Balloted</td>
<td>Specialty (legal) Ancillary</td>
<td>Universal</td>
</tr>
<tr>
<td>Child Health</td>
<td>HL7 Pediatric Data Standards SIG</td>
<td>Standard</td>
<td>Specialty (child health)</td>
<td>US</td>
</tr>
<tr>
<td>Behavioral Health</td>
<td>US Health and Human Services (HHS) Substance Abuse &amp; Mental Health Services Admin (SAMHSA)</td>
<td>Standard</td>
<td>Care setting</td>
<td>US</td>
</tr>
<tr>
<td>Electronic Health Records/Clinical Research</td>
<td>EClinicalForum</td>
<td>Approval In-Process</td>
<td>Ancillary</td>
<td>Universal</td>
</tr>
<tr>
<td>Health Authority-linked PHR</td>
<td>Trilogy Integrated Resources</td>
<td>Registered</td>
<td>Specialty, sponsor</td>
<td>Universal</td>
</tr>
</tbody>
</table>
Questions?

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