EHR Interoperability and Lifecycle Model DSTUs – Incorporation in EHRS Functional Model Release 2 (Drafts in Development)

HL7 EHR Interoperability WG
Co-Facilitators: Gora Datta, Gary Dickinson
4 October 2010
Conjoining HL7 EHR and EHRS Models

Objectives

• Bring Common Focus to System Functionality and Record Interoperability

• HL7 EHR System Functional Model Release 2, incorporate key content from:
  – HL7 EHR Interoperability Model DSTU
    • Passed ballot January 2007
  – HL7 EHR Lifecycle Model DSTU
    • Passed ballot February 2008

• Agreed by EHR WG, Kyoto, May 2009
EHR Interoperability/Lifecycle Models

DSTU Sections

• Correlation of Health, Healthcare and Health Information
• Correlation of instances
  – Actions taken
  – Action Records (to establish evidence of Actions taken)
  – EHR record entries (to persist evidence of Actions taken)
• Characteristics of Interoperable EHR Records offered as
  – Assertions (discrete Record Interoperability Requirements)
  – Examples
• Conformance Criteria specified for
  – EHR Systems and other Applications
    • In four key roles: source, transmitter, intermediary and receiver
  – EHR Records, to validate record instances at rest and in motion
  – EHR interchange standards
EHR Interoperability/Lifecycle Models

**DSTU Sections, con’t**

- **Stakeholder Assurance (to)**
  - Patients, Consumers – As Record Subjects
  - Healthcare Providers – As Record Originators, Authors, Sources
  - Any Authorized Individual – As Record Recipient

- **EHR Record Lifecycle and Lifespan**
  - Lifecycle Events
  - Lifecycle Event Initiators
  - System Roles in EHR Record Lifecycle
  - Audit and Traceability

- **Separately: Implementation Guide for CDA R2**
  - DSTU passed ballot, January 2008
  - CDA Attributes fulfilling EHR Interop Requirements
  - With Testability Criteria
All health and healthcare information derives from, or is attributable to, a discrete Action.

Actions are taken to support an individual’s health and to effect healthcare delivery and public health.

- Corollary: Healthcare is the sum of all Actions taken to ensure its safe and effective delivery.

The essential context of health and healthcare information is indivisible from its originating Action:

- Including Who, What, When, Where
Action – Action Record – EHR Record Entry

Occurrence and Evidence

• An Action is taken
  – i.e., a Task or Procedure is performed or a Service is provided or rendered.

• A record is initiated
  – Documenting (evidencing) Action facts, findings and observations.

• The resulting Action Record may be:
  – Retained; and/or
  – Interchanged (in whole or in part); and/or
  – Maintained and persisted (e.g., as an EHR Entry).
Action – Action Record – EHR Record Entry

Occurrence and Evidence, con’t
# Action – Action Record – EHR Record Entry

## Conjoined Instances

<table>
<thead>
<tr>
<th>Actions…</th>
<th>Action Records…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are tasks, procedures or services, taken in</td>
<td>• Document (evidence) each Action taken</td>
</tr>
<tr>
<td>• Support of individual health</td>
<td>• May be entries in a persistent datastore: e.g., EHR or PHR</td>
</tr>
<tr>
<td>• Provision, delivery of healthcare</td>
<td>• Form a common EHR unit of record</td>
</tr>
<tr>
<td>• Public Health</td>
<td></td>
</tr>
<tr>
<td>Occur instance-by-instance and chronologically over time</td>
<td>Have corresponding instances and chronology</td>
</tr>
<tr>
<td>Are a <em>unit of service</em> performed, rendered or provided</td>
<td>Have a corresponding <em>unit of record</em></td>
</tr>
<tr>
<td>Have a context – who, what, when, where</td>
<td>Document (evidence) Action context</td>
</tr>
<tr>
<td>Are accountable as to participants involved</td>
<td>• Document participating Actors</td>
</tr>
<tr>
<td></td>
<td>• Ascribe source and authorship</td>
</tr>
<tr>
<td></td>
<td>• Are attestable for accuracy, completeness</td>
</tr>
<tr>
<td></td>
<td>• May be digitally signed</td>
</tr>
</tbody>
</table>

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**Conjoined Instances**

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HL7 EHR Interoperability & Lifecycle to EHRS Functional Release 2
## Process and Information Correlation

### Typical Hierarchy & Intersection

<table>
<thead>
<tr>
<th>Process</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Cases</td>
<td>Health Records – e.g., Provider EHR, Individual/Personal HR, Population HR…</td>
</tr>
<tr>
<td>Comprise one or more</td>
<td>Typically incorporate one or more</td>
</tr>
<tr>
<td>Scenario(s)</td>
<td>Patient Encounter(s)</td>
</tr>
<tr>
<td>Comprise one or more</td>
<td>Comprise one or more</td>
</tr>
<tr>
<td>Event(s)</td>
<td>Entry(s) – Action Record(s)</td>
</tr>
<tr>
<td>Comprise one or more</td>
<td>Comprise one or more</td>
</tr>
<tr>
<td>Action(s)</td>
<td>Attribute Aggregation(s) e.g., archetypes, templates</td>
</tr>
<tr>
<td></td>
<td>Comprise one or more</td>
</tr>
<tr>
<td></td>
<td>Attribute(s) e.g., data elements, items or values</td>
</tr>
<tr>
<td></td>
<td>Some of which are encoded via standard</td>
</tr>
<tr>
<td></td>
<td>Vocabularies or code sets</td>
</tr>
</tbody>
</table>

Evidenced by
Real-World to EHR System to EHR Record

Use Case > Function > Event

Use Case (Real-world) Action

Invokes one or more...

EHR System (EHRS FM) Function(s)

SOA/SAIF

“Process” Service(s)

Invokes one or more...

EHR Record (EHR LM) Lifecycle Event(s)

SOA/SAIF

“Record” Service(s)
### A-G: Assertions, Examples

<table>
<thead>
<tr>
<th>EHR/IM Column</th>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>ID</td>
<td>New Draft Section Interop-1 (A, B, C, E, F)</td>
</tr>
<tr>
<td>B</td>
<td>Assertion/Characteristic</td>
<td>Remove (now included in CDA R2 Reference Profile DSTU)</td>
</tr>
<tr>
<td>C</td>
<td>Elaboration</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>&lt;Attribute Class&gt;</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Example</td>
<td>New Draft Section Interop-1 (A, B, C, E, F)</td>
</tr>
<tr>
<td>F</td>
<td>Use Case Example</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Legal Record Requirement?</td>
<td>TBD – Coordinate with RM-ES Team In Table with B?</td>
</tr>
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</table>

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## EHR Interop to EHRS Functional Model Release 2

### H-L: Conformance Criteria

<table>
<thead>
<tr>
<th>EHR/IM Column</th>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-L</td>
<td>Conformance Criteria</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Source EHRS/Application</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Source EHRS - Outbound</td>
<td>New Draft Section Interop-2</td>
</tr>
<tr>
<td>J</td>
<td>Interchange Standard</td>
<td>(A, B, H-L)</td>
</tr>
<tr>
<td>K</td>
<td>Intermediary Application</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Receiving EHRS/Application</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M-O</th>
<th>Key Stakeholder Assurance</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Patient (Record Subject)</td>
<td>New Draft Section Interop-3</td>
</tr>
<tr>
<td>N</td>
<td>Record Author/Originator</td>
<td>(A, B, M, N, O)</td>
</tr>
<tr>
<td>O</td>
<td>Record Recipient</td>
<td></td>
</tr>
</tbody>
</table>
## EHR Interop to EHRS Functional Model Release 2

### P-U: References, CDA R2

<table>
<thead>
<tr>
<th>EHR/IM Column</th>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Standards Reference</td>
<td>Include in EHRS/FM References</td>
</tr>
<tr>
<td>Q</td>
<td>EHRS/FM Reference</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Normative Clause</td>
<td>Remove</td>
</tr>
<tr>
<td>S</td>
<td>Progression</td>
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<tr>
<td>T</td>
<td>CDA R2 Reference</td>
<td>Remove – Already updated, balloted and published as “CDA R2 Reference Profile for EHR Interoperability” DSTU</td>
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<tr>
<td>U</td>
<td>Testability Criteria</td>
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</table>
## EHR Lifecycle to EHRS Functional Model Release 2

### Section by Section

<table>
<thead>
<tr>
<th>EHR/LM Section</th>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Background</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Purpose</td>
<td>New Draft Section Interop-Intro</td>
</tr>
<tr>
<td></td>
<td>Lifecycle Graphic from ISO 21089</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Objectives</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Health(care) Delivery</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The Health(care) Act</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>The Act Record</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>The Act/Act Record Paradigm</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>The Act Record Interchange Paradigm</td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

- New Draft Section Interop-Intro

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*4 October 2010*
## EHR Lifecycle to EHRS Functional Model Release 2

### Section by Section, con’t

<table>
<thead>
<tr>
<th>EHR/LM Section</th>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Events in the Act Record Lifecycle</td>
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</tr>
<tr>
<td>10</td>
<td>EHR Lifecycle Event Initiators</td>
<td><strong>New Draft Section Lifecycle-1</strong></td>
</tr>
<tr>
<td>11</td>
<td>Description of EHR Lifecycle Events</td>
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<tr>
<td>12</td>
<td>System Roles in the EHR Lifecycle</td>
<td><strong>New Draft Section Lifecycle-2</strong></td>
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<tr>
<td>13</td>
<td>Audit and Traceability</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Conformance Criteria</td>
<td></td>
</tr>
</tbody>
</table>
Proposed Inserts

1) EHR Interoperability/Lifecyle Introduction (Interop-Intro)
2) Characteristics of Interoperable EHR Records (Interop-1)
3) EHR Record Lifecycle Events (Lifecycle-1)
4) DC, S, IN – column linking function to lifecycle event(s) (and corresponding SOA/SAIF Service?)
5) Conformance Criteria for System Roles (Interop-2)
6) Conformance Criteria for Lifecycle Events (Lifecycle-2)
7) New Appendix: Stakeholder Assurance (Interop-3)