Introduction to archetypes and templates

Ian McNicoll
“I want to record Pulse rate”
UML: Clinically unfriendly
Clinically-accessible?

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TypeId</td>
<td>Retrieves the unique identifier for the item type.</td>
</tr>
<tr>
<td>AllergenCode</td>
<td>Gets or sets the code for the allergen that causes an allergic reaction.</td>
</tr>
<tr>
<td>AllergenType</td>
<td>Gets or sets the type of allergen that causes an allergic reaction.</td>
</tr>
<tr>
<td>CommonData</td>
<td>Gets the common data for the HealthRecordItem.</td>
</tr>
<tr>
<td>Created</td>
<td>Gets the audit information associated with the creation of this health record item.</td>
</tr>
<tr>
<td>EffectiveDate</td>
<td>Gets the date and time that the health record item data was taken.</td>
</tr>
<tr>
<td>EffectivePermissions</td>
<td>Gets the effective permissions on the item granted to the person retrieving the HealthRecordItem.</td>
</tr>
<tr>
<td>FirstObserved</td>
<td>Gets or sets the approximate date of the first occurrence of the allergy.</td>
</tr>
<tr>
<td>Flags</td>
<td>Gets the HealthRecordItem flags.</td>
</tr>
<tr>
<td>HealthRecordItemSignatures</td>
<td>Gets the signatures for the HealthRecordItem.</td>
</tr>
<tr>
<td>IsDownVersioned</td>
<td>Gets the value indicating if the HealthRecordItem is down-versioned.</td>
</tr>
<tr>
<td>IsImmutable</td>
<td>Gets a value indicating whether the HealthRecordItem is immutable.</td>
</tr>
<tr>
<td>IsNegated</td>
<td>Gets or sets a value indicating whether the allergic reaction is negated with treatment.</td>
</tr>
<tr>
<td>IsPersonal</td>
<td>Gets or sets the value indicating if the HealthRecordItem is private.</td>
</tr>
</tbody>
</table>
openEHR: clinicians in control

- Third-party apps
- Vendor-neutral Information model
- Technology-neutral datastore (CDR)
openEHR: Multi-level modelling
openEHR: Reference Model (RM)

- Generic technical architecture for representing a patient health record
  - Data structures and types
  - Overall health record structure
  - Security, Versioning
  - People, Dates, Times etc.

- Deliberately hidden in the clinical modelling tools
openEHR: Archetypes

- open source computable models of discrete clinical concepts

- Familiar components of a health record
  - Blood pressure, Body weight
  - Medication order, Family history
  - Urea, Creatinine results

- ‘Maximal dataset’
  - Capture as many clinical perspectives as possible
New openEHR archetype/template tooling
The Clinical Process

1. Observation
   - Previous results
   - Current observations

2. Evaluation
   - Domain Experts
   - Domain Knowledge

3. Instruction Orders

4. Action
## Multi-lingual archetypes

### Heart Rate

**Archetype:** Частота и ритм сердечных сокращений (openEHR-EHR-OBSERVATION.heart_rate.v1)

<table>
<thead>
<tr>
<th>Structure</th>
<th>Tree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occurrences</td>
<td>1..1 (mandatory)</td>
</tr>
<tr>
<td>Cardinality</td>
<td>0..* (optional, repeating, unordered)</td>
</tr>
</tbody>
</table>

**ЧСС в настоящее время**

- **Boolean**
- Occurrences: 0..1 (optional)
- Частота сердечных сокращений в настоящий момент (подразумевается истина, если скорость > 0).

**Частота**

- **Quantity**
- Occurrences: 0..1 (optional)
  - [SNOMED-CT::364075005] (Heart rate (observable entity))
  - [LOINC::8893-0] (HEART BEAT:NRAT:PT:PERIPHERAL ARTERY:QN:PALPATION)
- Частота сердечных сокращений в минуту.

**Характер ритма**

- **Coded Text**
- Occurrences: 0..1 (optional)
  - [SNOMED-CT::364074009] (Regularity of heart rhythm (observable entity))
- Наблюдаемый ритм сердцебиений.

**Property:** Frequency

- Units: >=0.0 /min
- Limit decimal places: 0

- Регулярный [Сердечный ритм регулярный.]
  - [SNOMED-CT::248649006]
- Постоянно нерегулярный
  - [SNOMED-CT::248652003] (Heart regularly irregular (finding))
- Непостоянно нерегулярный
  - [SNOMED-CT::248651005] (Heart irregularly irregular (finding))
openEHR Templates

- Computable models bringing together component archetypes
- create a dataset for a particular clinical context or purpose
- adjust component archetypes to make them 'fit for purpose'
  - make items mandatory
  - remove unwanted items
  - set default values
  - create terminology mappings
- In practice, creating a dataset to underpin data entry / message / interface definitions

‘Aggregate’ and ‘constrain’ component archetypes to make them fit for purpose
openEHR: Templates

- Templates deliver the datasets by aggregating archetypes together.
- Key clinical endpoint and start point for generation of technical artefacts.
- i.e. openEHR archetypes and templates can be used directly.
  - Class libraries, Message schema
  - GUI skeletons, API Profiles
Templates vs Forms

Template = Dataset

Form = User Interface

Vital Signs Encounter (Composition), Draft Template [Internet]. UK Clinical Models, UK Clinical Models Clinical Knowledge Manager [cited: 2016-03-09]. Available from: http://clinicalmodels.org.uk/ckm/#showTemplate_1051.57.23

https://www.ehrscape.com/forms-demo.html
ADL Designer - Template
Archetype re-use

Template underpinning application

Archetypes used in template

ISSUE
Tingling feet, feeling tired

WEIGHT
76kg

Blood Pressure
124/92

HbA1c
7.5%

Assessment
Excellent control

Cardiology Clinic

Issue
High Blood Pressure

Weight
66kg

Blood Pressure
192/114 mmHg

Pulse Pressure
78 mmHg

spO2
92%

Assessment
NAD, see 4/52
Templates - the openEHR ‘workhorse’?

- Archetypes get the glory, templates deliver the datasets
- Key clinical endpoint and starting point for generation of technical artefacts
  - Class libraries, GUI skeletons, Message schema
- Most demand for archetyped content will originate as requests for datasets
  - Data entry forms
  - Diabetes shared care message
  - Discharge summary message
Where does terminology fit?

- Each archetype carries its own unique, internal terminology, to support multiple languages
  - “Diastolic” [at0005]

- Archetypes and templates work alongside external terminologies, not in conflict
  - We can specify ‘bindings’ to multiple external terminologies
    - e.g. ICD, SNOMED CT, LOINC
openEHR: open-source collaborative clinical content factory
openEHR content underpins the ‘open platform’

- New content defined directly by clinicians and immediately uploaded into the clinical data repository
  - Vendor-neutral data models
  - Technology-neutral data models
- New content
- No re-engineering