

# Archetypes - Update

- Heath Frankel
- 25 May 2006



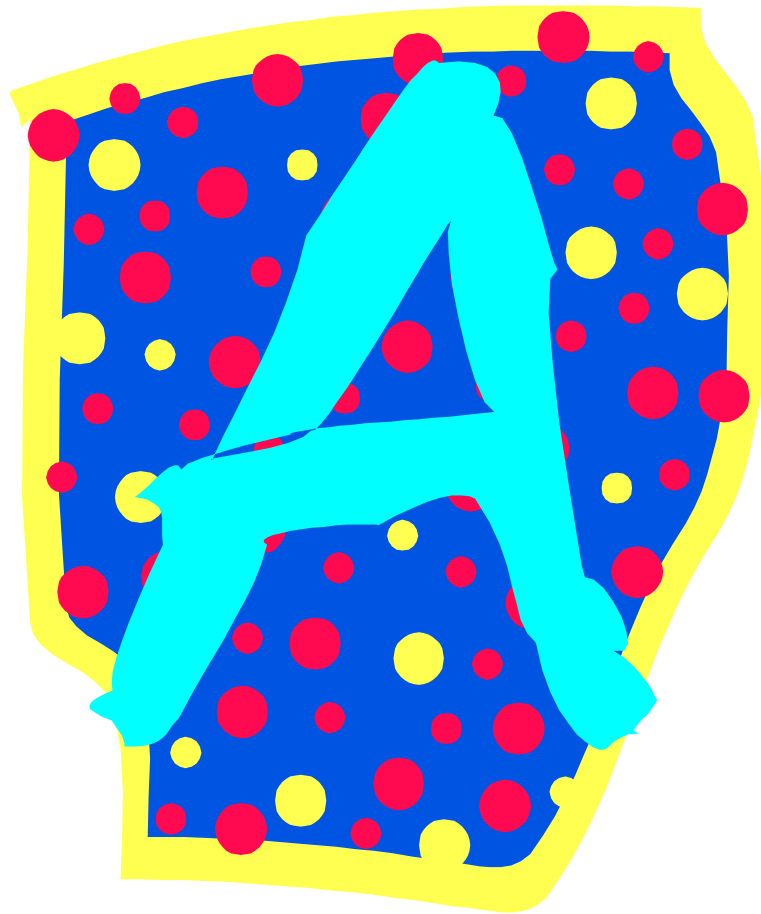
10th HL7 Australia  
Conference, Sydney



# Overview

- Archetypes Update
- Mapping HL7 information into openEHR archetypes
- Experience with HL7 V3, CEN 13606 and openEHR
- Using Archetypes in HL7 v3/v2
- Using Archetypes in CEN 13606
- Service Oriented EHR Architecture
- EHR API (Build/Commit/Query)
- Facades/Proxies for existing Systems
- Using Archetype Paths and Queries
- Persistence of Archetyped data

# What is an archetype?



- A formal model of a clinical concept “in-use” (not a reference concept)
- It is separate from the information model used for persistence

# openEHR - Update

- Release 1.0, 1.0.1 (minor fixes)
  - Data Types
  - Common/Support/Structure Classes
    - Archetype labelling, Trees, Tables, Lists
    - Identification, Auditing
    - Contributions, Version Control
  - EHR RM
  - Demographics
  - Archetype Object Model
  - XML Schema
- Release 1.1
  - EHR Extract
- Conformance Testing Plans – Schema/Archetypes/Terms

# CEN EN13606 - Update

- Part 1: EHR Extract Reference Model
  - CEN final vote, standard by end 2006
  - ISO DIS ballot, standard by end 2007
- Part 2: Archetype Interchange
  - Generic Archetype Information Model
  - CEN approved Enquiry ballot, final vote draft
  - ISO – no final position
- Part 3: Reference Archetypes and Terms
  - HL7 V3 Acts, openEHR specialised Entries
  - CEN Enquiry ballot draft

# CEN EN13606 - Update

- Part 4: Security
  - Interoperable EHR disclosure consent, disclosure log
  - CEN approved Enquiry ballot, final vote draft
- Part 5: Exchange models
  - Temporarily on hold
  - Harmonization process – EHR Extract RMIM
  - Likely to be driven through ISO

# Archetypes - Update

- Archetype Repository  
<http://www.dualitysystems.com.au/archetypefinder/archetypefinder>
- Mindmap of Archetypes  
<http://oceaninformatics.biz/archetypes/MindMap/ArchetypeMap.html>
- ADL 1.4
  - Support Duration, ISO8601 Alignment
- ADL 2.0
  - dADL/cADL => Single syntax

# openEHR Templates - Update

- Correlation to Form or Screen
  - Archetype enable applications
- Aggregate Archetypes and Constrain
  - Make mandatory
  - Constrain multiplicity
  - Exclude optional
  - Specify Terminology/Code sets
  - Default values
- Template Object Model => tDL
- Link to Terminology Services
  - constrained terminology queries



# openEHR Clinical Review Board

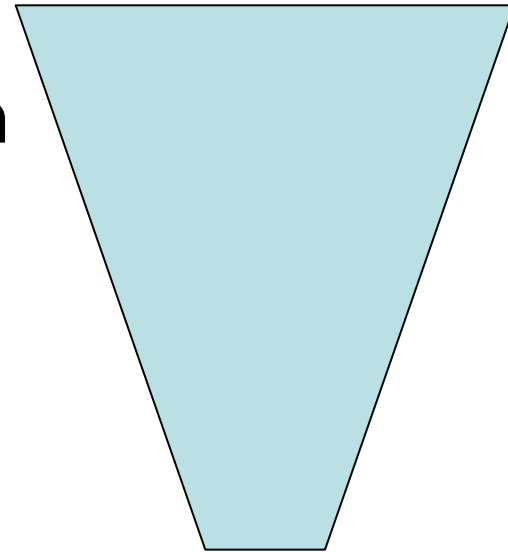
- Determine framework for Archetype Governance
- Forum for Archetype development
  - Substance Use
  - [openehr-clinical@openehr.org](mailto:openehr-clinical@openehr.org)

# Mapping HL7v2 to openEHR Archetypes

- HL7v2 Optionality+
  - Subject id/name
  - Service Id, Observation Id, Status
- openEHR – full audit trail
  - subject id, service setting
  - reporting time, author
  - committal system, feeder system
  - content data (archetype specified)

# Layered constraints

- HL7 Message Standard
- HL7 Message Implementation
- EHR Reference Model
- EHR System Implementation
- Archetypes
- Templates



REQUIREMENT: Consistent rules for mapping  
HL7 data into openEHR archetypes

- May inform HL7 Handbook developers

# HL7 V3 meets CEN EN13606

- Using CEN 13606 structures in HL7v3
  - EHR Extract RMIM using Clinical Statement
- Using HL7v3 structures in CEN13606
  - CEN 13606 Part 3: Reference archetypes

# Experience with HL7 V3

- RIM - Rich in clinical semantics
  - Agreement on those semantics
  - Use of the semantics
  - Overlap of the semantics (internally/terminology/archetypes)
- Patient Care – conditions, allergies, care plans
  - Multiple schema (Referral, Discharge Summary, Pharmacy Order, Investigation Report, Allergy/Problem Update)
- Versioning – instance, version set & view
- Clinical Statement
  - Pattern, to use or not (scope)

# Experience with HL7 V3

- CCD – narrative conformance statements, cross domain requirements
  - consistency?
- Order Sets (Guidelines)
  - Knowledge Documents
  - Feed into Care Plans (instance of Guideline)
- CEN 13606 UML => RMIM
  - HL7 V3 ITS (20:1 noise)
  - An efficient ITS does not change the RIM semantics







# Archetypes in HL7v3

- What archetypes?
  - Battery cf. Microbiology, FBC, Blood Pressure
- Templates - use of ADL, OWL, MIF, OCL
  - Ongoing

# Archetypes in HL7v2

- IT14-6-6 Taskforce
- OBR - Section
- OBX - Entry
  - OBX.3 = archetype/node Id
  - OBX.4 = grouping/level
  - OBX.5 = value

# Archetypes in CEN 13606

- Building anything, anyhow
- openEHR – inherit high-level concepts
  - Observation, Evaluation, Instruction, Action
  - History, Tree, Table, List

# Using Archetypes in Applications

- Generic EHR Viewer
  - Generic display logic based on RM
  - Display logic to specialise views of archetypes
  - Context-oriented specialisations
    - Detailed/Summary

**Histology report (765534)**

Reported by Sam Heard

**Histological diagnosis**: Seminoma, testicle;

## HISTOLOGY REPORT

Report date: 19/02/2006 time: 04:03h

Reported by: Sam Heard

Report number: 765534

### Clinical findings

#### Clinical

Not much

#### Specimen

Description: Skin

#### Macroscopic

Appearance: Nil of note

#### Microscopic

Findings: Not much either

### Summary

#### Clinical synopsis

Normal

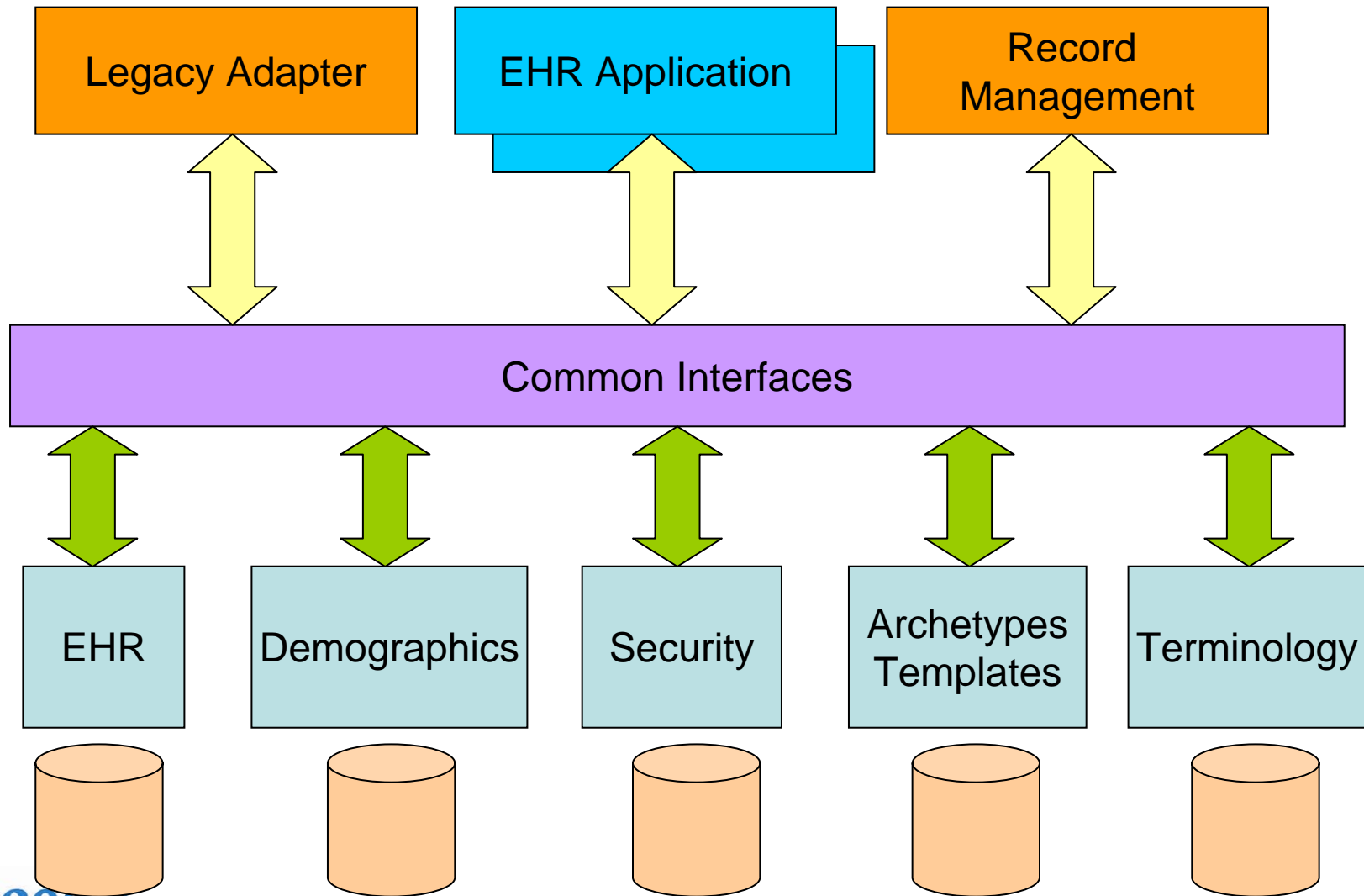
#### Histological diagnosis as defined by a clinician

Histological diagnosis: Seminoma, testicle

# Using Templates in Applications

- Template Driven Data Entry
  - Generated forms based on template
  - Additional presentation layout
  - Support presentation layer validation

# Services Oriented EHR Architecture



# EHR API (Query/Build/Commit)

- ExecuteQuery/RetrieveResults
  - Traversal and getter methods
- Create Contribution
- Create/Checkout Composition
  - Factory and Setters Methods
- Commit/Rollback Contribution
  - List<Composition> + Audit Details

# Facades/Proxies for existing Systems

- Common interface to existing systems
  - Authentication, Access control, Single sign-on
  - PMI, Client Directory, Demographics



# Using Archetype Paths

- EHR URI

ehr://top\_level\_structure\_locator/path\_inside\_top\_level\_structure

- Path to latest version of composition

ehr://rdh.health.gov.au?ehr=1234567  
&versioned\_composition=0892BF98-910D&latest\_version

- Path to specific version of composition

ehr://rdh.health.gov.au?ehr=1234567  
&version=0892BF98-910D::rdh.health.gov.au::2&data

- Path to content item

/content[openEHR-EHR-SECTION.vital\_signs.v1]  
  /items[openEHR-EHR-OBSERVATION.blood\_pressure.v1]  
    /data/events[at0006 AND time='2006-01-25T08:42:20']  
      /data/items[at0004]  
/vital signs/blood pressure  
  /baseline reading[time='2006-01-25T08:42:20']/systolic

# Using Archetype-based Queries

- Select ...FROM ...WHERE ...
- EHR content header information

```
SELECT c/context/startTime, c/Name/value, c/composer/name,  
       v/uid
```

```
FROM EHR[uid='29345B132C94'] CONTAINS VERSION v  
     CONTAINS COMPOSITION c
```

- Filtered content lists

```
FROM EHR[uid='29345B132C94'] CONTAINS VERSION v  
     CONTAINS COMPOSITION  
     c[openEHR-EHR-COMPOSITION.report.v1]
```

Date	Composition Name	Composer Name
19/02/2006	Histology report	Sam Heard
22/05/2006	Histology report	H Frankel
22/05/2006	Histology report	Roel Stap

# Using Archetype-based Queries

- Specific version of composition criteria

```
SELECT c FROM EHR[uid='AFE8-29345B132C94'] CONTAINS  
    VERSION[uid='742D1F2F3BB2'] CONTAINS COMPOSITION c
```

- Clinical criteria

```
SELECT o/data/events[at0006]/time,  
    o/data/event[at0006]/data[at0003]/item[at0004],  
    o/data/event[at0006]/data[at0003]/item[at0005]  
FROM EHR[uid = '29345B132C94'] CONTAINS Observation  
    o[openEHR-EHR-OBSERVATION.blood_pressure.v1]  
WHERE o/data/event[at0006]/data[at0003]/item[at0004] > 140
```

# Persistence of Archetyped data

- Object Store
- XML Store
- Relational Database
  - Object-Relational mapping tools e.g. Hibernate
  - Indexed XML blobs (Composition/Entry)
  - Name/“Path”-Value pairs
  - Hybrid (XML blob/Path-Value)