Exchanging Data via openEHR for Patient-Specific Overviews in Intensive Care: A Case Study

short communication at MIE 2011

by

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Presenter: Nadim Anani
Oslo, 2011-08-31
Aim & Importance

Aim: To investigate the possibility and capture technical experiences of using openEHR to exchange data for decision support on antibiotic use in intensive care.

Importance: Extending practical experiences in implementing openEHR’s semantic technology, as quite a limited number of implementations exist (especially based on real-life EHR systems).
ICU Overview & EHR Application
Promising Integration Framework (I)

ICU Overview

openEHR: a reference model + archetypes/templates

COSMIC

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Promising Integration Framework (II)

openEHR: a reference model + archetypes/templates

ICU Overview

Guidelines

Clinical Decision Support

COSMIC

XYZ

ABC
Implementation Methodology

(1) Groups of archetype(s)-template constraints: chemistry, past antibiotics, radiology, microbiology, physiology, demographics

(2) archetype(s)/template combination
    → reference model skeleton
    → XML files
    → concrete data, e.g. patient temperatures
Design/Development Technology & Tools Used

openEHR Release 1.0.1 (ADL 1.4, OET template format)

Tools:
• Java Reference Implementation
• openEHR Clinical Knowledge Manager
• Ocean Archetype Editor
• Ocean Template Designer

Archetypes: lab_test, body_temperature, medication, body_mass_index, catheter_insertion, imaging, lab_test-microbiology
Results

• The openEHR RM was found expressive enough to achieve the data integration.

• Archetypes reused 6, modified 1, created 1:

• Available openEHR tools were sufficient to realise the integration, but more community-based tools need to be developed.
Conclusions / Discussion

• The openEHR two-level modelling approach is useful for data integration between two heterogeneous systems.

• Existing clinical content models in the form of openEHR archetypes are reusable.

• Exporting data needed for transformation to openEHR format from a large EHR application can be complex and adds one more indirection, but could prove rewarding in the long term.
Possible Future Directions

- openEHR facilitation of overviews in general
- openEHR-based conformance checking to EBM and support of distributed clinical processes (ongoing PhD project)

Thank you for your attention!

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