

Towards Semantic Interoperability of EHR Based on Two Level Modelling and Reference Terminologies

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Aims and Objectives

- Achieve Semantic Interoperability of EHR using two-level modelling and reference terminologies

- EHR? ISO EHR Definition, Scope; Requirement EHRA
- Interoperability? Diff. levels
- Two-level modelling? Archetypes?

■ Separate concerns of knowledge representation and system engineering and to use the information that has been

■ Archetypes are models of clinical concepts created as constraints of the information model

- Standards based logical information model provides interoperability on syntactical & structural level
- Semantic level of interoperability
- Meaning of the data defined by archetypes and its bindings to external terminologies
- semantics of the data with shared meaning of terms and expression

* quoted from ISO 15175:2001, "Health Informatics - EHR - Use and Control"

Background & Justification

- Interoperable EHR rare in reality
 - Inefficient care; high patient risk
 - Poor secondary EHR use
- Two-level modelling approach innovative but requires more explorations
 - How it can be implemented in real EHR systems
 - How can legacy EHR benefit from it
 - Linkage between EHR, Archetypes & terminologies
 - Interoperability between EHR and Surround systems
 - Governance of Archetypes

Research Questions

- How to achieve semantic interoperability of EHR using two level modelling and reference terminologies
 - How to define semantic interoperability of EHR systems?
 - What is the state-of-art interoperability achieved by the current EHR systems?
 - How does template-based EHR compare with archetype-based EHR system? And what is the difference to do with interoperability?
 - How can two-level modelling of EHR and archetypes improve the interoperability of legacy EHRs
 - How does archetypes based EHR system interact with surrounding systems, like Decision Support System without losing the semantics of the data?
- Archetypes won't work – why?

Current Result and future work

Papers

- JULIUS - a Template Based Supplementary Electronic Health Record System
 - compared to archetypes based architecture
- The openEHR Java Reference Implementation Project
 - Early openEHR implementation experience
 - Provide software components for interoperable EHR system
 - Feedback to openEHR design specifications
- Child Leukemia Treatment Management System A Pilot EHR Application Based on the openEHR Architecture (manuscript)

Software

- The openEHR Java Reference Implementation Project

Planned work

- Persistence layer design for archetype based EHR system (requirement analysis and design of EHR Query Service)
- Further validation of openEHR Archetypes / Templates with existing templates in Cambio COSMIC, end-user evaluation of archotyping
- Archetypes based EHR transmission between two EHR systems