Employing SNOMED CT and LOINC to make EHR data sensible and interoperable for clinical research

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Audience

Managers of enterprise data warehouses; Research network data managers; Ontologists; Clinical researchers; Architects and leaders of research networks

Objectives

- Understand the scope, function and utility of i2b2 in developing a research network data repository
- Appreciate the role of SNOMED CT, LOINC and other clinical ontologies in preparing for interoperable use of clinical research data
- Explain how SNOMED CT and LOINC can make EHR data sensible, re-usable and structured

Abstract

Growing from the drive toward Meaningful Use of interoperable Electronic Health Records(EHR) in the US, research and public health data networks are forming funded by national initiatives. The Patient Centered Outcomes Research network(PCORnet)[1] and the Observational Medical Outcomes Partnership(OMOP)[2] are two examples of several. Open source tooling platforms to manage research data network nodes have been developed with federal monies, one example being i2b2[3]. i2b2 supports a simplified information model based upon a star schema which can accept diverse data resources but makes no explicit commitment to standards-based domain ontologies or reference terminologies.

The Greater Plains Collaborative(GPC)[4] is one PCORI network coordinating 10 US healthcare institutions and is employing i2b2 in support of interoperation of clinical research and quality assurance data sharing. Our network includes Epic, Cerner and locally developed EHRs.   We have developed our elaboration of the i2b2 star schema in collaboration with other PCORnet initiatives and have followed basic design principles of query-based interoperation with other reputable data models including adherence to ONC Standards & Interoperability guidelines. Given the centerpiece roles of SNOMED CT and LOINC in those guidelines; 1)diagnoses, 2)procedures, 3)laboratory, radiological and clinical observables, 4) patient health history and 5)orders all require SNOMED CT and LOINC in their domain ontologies to support interoperation.

This presentation will explain the use case for research data interoperation, inform the attendee as to technical and requirements of i2b2, review the process of ontology development in support of the GPC information model and demonstrate an exemplar case of research data interoperation between our member institutions employing harmonized instances of domain ontologies employing SNOMED CT 20130901 (US) and LOINC 2.38.

References

1. http://www.pcori.org/funding-opportunities/pcornet-national-patient-centered-clinical-research-network/
2. http://omop.org
3. http://www.I2b2.org
4. https://informatics.gpcnetwork.org/trac/Project