Representing and sharing knowledge using SNOMED
Proceedings of the 3rd international conference on Knowledge Representation in Medicine (KR-MED 2008)
R. Cornet, K.A. Spackman (Eds)

The Integration of SNOMED CT into the OpenMRS Electronic Medical Record System Framework

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Abstract

OpenMRS, an open-source framework used for the management of medical records, uses a basic concept dictionary to drive its data model. SNOMED CT is an ontology organising medical record content in order to provide a consistent mechanism to store, retrieve and use clinical data across specialties and sites of care. This poster proposes a project that aims to extend OpenMRS with the integration of SNOMED CT and related ontology technologies.

PROJECT DESCRIPTION

OpenMRS is an open-source application framework enabling the design and implementation of customizable medical records systems aimed primarily at medical informatics efforts in developing countries [1]. It is based upon an application developed by the Regenstrief Institute and Partners in Health based on experiences in Kenya, Haiti and Rwanda [2], and is currently implemented in countries such as Kenya, Rwanda, South Africa, Uganda, Tanzania, Zimbabwe, and Peru with scope to extend the adoption in multiple other locations throughout Africa [1]. It also claims nearly twelve million discrete observations collected for nearly 50,000 HIV patients with over 550,000 encounters in the AMPATH OpenMRS implementation in Kenya alone [1, 3]. It is implemented in Java and uses MySQL as database. The central data model is driven by a concept dictionary, which allows for the collection of coded, reusable data without requiring changes to the data model. The concept dictionary is a collection of coded, unique concepts used to generate forms and encode data that is captured within the system [4].

Generally, ontologies facilitate the structuring of information and data in a specific domain in such a way that systems can reason over it. Ontologies thus provide mechanisms that extend the representational and computational limits of traditional databases and other knowledge representation systems [5, 6]. Arguably, one of the most successful application area in this regard is the biomedical field, as witnessed, for example, by the widespread use of the medical ontology SNOMED CT [7] which addresses most areas of clinical information using a representation language that allows for computer processing [7].

The OpenMRS concept dictionary can be regarded as a crude ontology, and the extension thereof to use a formal ontology such as SNOMED CT with the associated technologies for the management and use of captured data, as well as for the generation of input forms, is the purpose of the project proposed by this poster. The project aims to investigate all aspects with regards to methodology, enhanced functionality and reasoning that can be the benefits of integration of SNOMED CT into OpenMRS.

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