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LinkEHR: A Tool for Standarization and Integration of Legacy Clinical Data

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Abstract

It is just a matter of time that standard based information systems for medicine become completely necessary. However, the system migration can turn to a huge loss of information if the pre-standard subsystems are not integrated on the electronic health records (EHR) system. LinkEHR aims to help integrating those pre-standard subsystems into the main EHR system providing at the same time a terminology binding and semantic improvement of the information. Using archetypes known as "integration archetypes" let us to map data sources to standard based EHR information systems.

Keywords:

standardization, systems tntegration,
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Introduction

During years, the lack of a standard on Electronic Health Records (EHR) has become one of the main issues on communication and interoperability of medical systems. Nowadays, obtaining a complete patient medical record still turns into a great effort on manual integration of the distributed systems among the organization. To solve this, organizations like European Committee for Standardization (CEN), OpenEHR or HL7 are providing new standards for EHR. CEN and OpenEHR are based on a dual model methodology that makes use of archetypes to manage the separation between information and knowledge [1].

However, although new standard based systems will have a standardized reference model making systems interoperable, it is not acceptable to lose current patient medical records. There is a need for a tool that helps to integrate those non-standard EHR in some way into the new information system. LinkEHR is a multi reference model tool that gives solution to this problem allowing the creation of standard-based archetypes offering mapping capabilities on data sources.

LinkEHR Features

- Multi reference model: LinkEHR is able to handle different reference models in order to guide the archetype's definition process. The importation of a new reference models is done by analyzing the XML Schema Definition (XSD) of the imported reference model. LinkEHR currently fully supports CEN and OpenEHR standards. In fact, LinkEHR is the first archetype editor for CEN EN13606.
- Data source mapping: One of LinkEHR's main features is the capability to define mappings between archetypes and data sources. The only requirement data source must fit is to be representable as XML (such as relational data bases or XML documents). The mapping syntax allows the definition of some useful transformation functions between data sources and archetypes. Mappings are stored with the textual representation of the archetype (ADL [2]) as an extension of it. These are the so called "integration archetypes".
- Semantic validation: The creation of archetypes in LinkEHR is fully guided by the reference model and parent archetype (if it exists). LinkEHR assures that the new archetypes satisfies both the constraints stated in the reference model entity being archetype and the archetype being specialized.(subsumption operation compliance [3]).

Conclusion

Standards-based EHR are undoubtedly the future on information systems development. LinkEHR will allow health institutions to integrate existing medical records into the new systems providing a fully semantic view of stored data.

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