LexCare Suite: Korean National Terminology Server for Interoperable EHR

Sungin Lee, Senator Jeong, Soo Kyoung Lee, Seung-Jae Song, Hong-gee Kim

Biomedical Information Knowledge Engineering Laboratory, School of Dentistry, Seoul National University, Seoul, Korea

Abstract and Objective

This poster describes our ongoing efforts spanning more than 5 year, in which a terminology server, comprising a centrally-managed terminology repository and terminology management applications, has been developed as part of a government-funded initiative to develop core technologies necessary to implement lifetime EHR. The server called LexCare Suite houses core standard reference terminologies such as International Classification of Disease (ICD-10), International Classification for Nursing Practice(ICNP), Systematized Nomenclature of Medicine(SNOMED-CT), Logical Observation Identifiers Names and Codes(LOINC), Korean Standard Terminology of Medicine(KOSTOM, a Korean equivalent of UMLS), and RxNORM. The server comprising LexCare Editor (a localized and customized LexGrid editor) and auxiliary modules is developed to meet the terminology needs of primary to tertiary hospitals in Korea. This paper introduces LexCare Suite in detail.

Keywords:

Electronic health records, Terminology, Medical records, Information system, Database, Medical informatics application

Methods

Components of LexCare Suite

There are two main components in the Suite: LexCare Editor and Terminology Repository, which houses ICNP, ICD-10, RxNORM, SNOMED-CT, LOINC, KOSTOM. The LexCare Editor comprises Terminology Browser and Concept Mapper. The Terminology Repository houses six LexGrid-converted terminology systems. This poster describes the Concept Mapper.

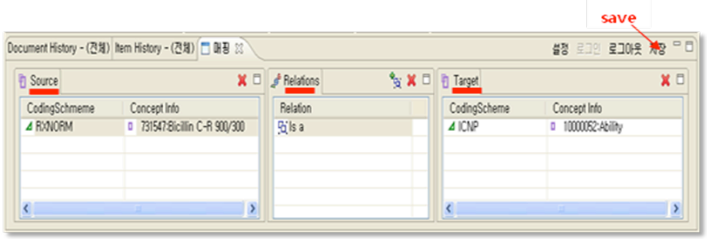

Figure 1 – Concept Mapper

Concept Mapper

Local terminology specialists in local hospitals have great demand for an easy-to-use, (semi-) automatic, semantics-enabled concept mapper, which will facilitate their day-to-day terminology related tasks. Our approach to this demand is to use collective intelligence, which in our case, can translate into collecting and storing previous mapping activities of terminology specialists and use them to guide users to the most 'correct' concepts for mapping. The historical data of mapping activities are stored at a remote server. And when a user wants to find a matching concept for a source concept, the previously matched target concepts are automatically loaded, with concepts with highest weights showing up first. Each mapping activity is given a weight based on several parameters: activity recency, organization he/she works for, his/her job title as terminology specialist, etc. We believe that, with a reasonable amount of mapping activities recorded and with enough resources such as time and users, this will work like an automatic concept mapper.

Results

The LexCare Suite is mature enough in terms of its contents and functionalities to be applied in local hospital environments. Two participating hospitals have been testing the Suite in terms of its applicability and usability within their hospitals. Web services are being implemented that provide interfaces to external applications such as LIS (Laboratory Information Systems) and local clinical data dictionaries.

Conclusion

The LexCare Suite has become an important technical advancement and testing ground for a national terminology server that aims to services the medical terminology needs of local primary to tertiary hospitals and public and private clinics. To our best knowledge, the LexCare Suite is the first attempt to use the LexGrid model as the generic terminology server model to serve the terminology needs of all the hospitals in a nation. The LexCare Suite is by no means a completed endeavor, and further support for post-coordination of concepts, and additional incorporation of terminology systems, such as KCD-5, a Korean equivalent of ICD-10 developed by Statistics Korea, are in order for future work.