Enhanced Mapping Method for Medical Terminology

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Abstract and Objective

Medical terminology mapping imposes tremendous challenges in ensuring healthcare information sharing and developing structured physician-patient encounter documentation. Each hospital at present uses its own collection of mapping guidelines created by different departments. Though some mapping assistance programs are available, most of them focus on providing a 'suggestion list' of candidate concepts, lacking in objectivity needed for decision making, resulting in discordance in mapping results. We here propose a novel mapping method, which aims to increase trust for mapping results, and to facilitate ease of use. The method uses collective intelligence, which translates into collecting mapping results of terminology specialists, which subsequently are used as mapping guidelines for other mapping activities. The collected knowledge is housed at a remote server for efficient sharing of knowledge related mapping. The method has been implemented as an add-on module of a national terminology server called LexCare Suite.

Keywords:

Medical informatics, Electronic health records, Terminology, Information management, Knowledge.

Methods

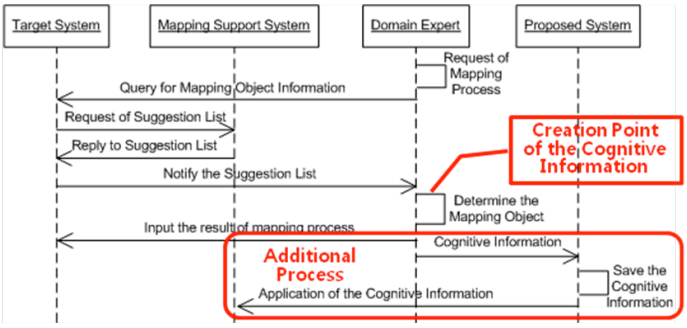

Figure 1 - Enhanced Mapping Process

Most of current mapping methods employ techniques, such as lexical matching, originated from Natural Language Processing (NLP) and various ways to provide suggestion lists of candidate concepts to choose from. Using this semi-automatic mapping process, the user chooses the most appropriate concepts from those suggestion lists. This process inevitably involves the cognitive endeavors of the user, which current mapping methods have not addressed or incorporated in them.

This study aims, in general, 1) to create an ontology to semantically capture and store the cognitive process of terminology specialists, 2) to use the captured mapping expertise to generate refined suggestion lists of target concepts, and 3) to provide the user the sense of automatic mapping by means of such collectively cumulated knowledge.

Results

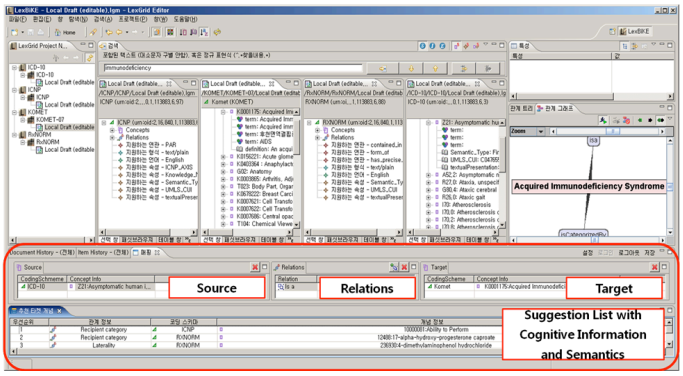

Figure 2 – Mapping Prototype

Figure 2 shows a prototypical implementation of the suggested method, in which the user drags and drops a source concept, at which point any previous mapping results, involving the source concept and residing at a remote server, are automatically displayed as a list from which the user chooses the most appropriate target concepts. The final result is stored back at the remote server.

Conclusion

There have been few attempts to semantically capture cognitive process of medical concept mapping, much less to reuse such knowledge. This study shows our ongoing research activities in which an ontology to capture terminology specialists' cognitive process is created and used to produce refined concept suggestion lists. The accumulated knowledge housed at the server is the reflection of experts' domain knowledge and as such, will become in time a tool to support automatic terminology mapping.