MEDINFO 2007
HISA Ltd Australia
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Development of Reference Terminology in Korean Health Domain

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Abstract

To know whether existing terminologies are applicable to our environments or not, we analyzed the structure of health information vocabularies and other terminologies. From this, we knew the necessity of reference terminology suitable for our environment. To make Korean reference terminology in health domain, we made three models— Meta, Conceptual, and Instance model— based on the structure of our terms. And we constructed database based on these models. Our work is expected to be a useful precedent to develop reference terminology appropriate for our environments.

Keywords:

vocabulary, controlled; Korean language

Introduction

Reference terminologies and terminology services permit retrospective and real-time aggregation, and sophisticated decision support. A reference terminology is a formal terminology where each term has a computer-usable formal definition supporting data aggregation and retrieval. Such formal terminologies promise to reduce maintenance and mapping effort [1, 2].

To accomplish and continually improve medical records documentation, improve care quality, promote patient safety, and reduce costs, we made reference terminology models.

Methods and results

Analyses

To know whether existing terminologies are applicable to our environments or not, we analyzed the structure of health information vocabularies which have been collected by National Health Information Standard Committee and other terminologies—UMLS and SNOMED CT.

Collected terms are being used in 12 departments (or domains)— Clinical Findings and Problems, Diagnoses, Operations and Procedures, Nursing, Laboratory, Imaging, Medical Device, Dentistry, Oriental Medicine, Drug, Public Health, and Health Statistics. The structure of these terms was domain specific and had various structures. We also analyzed UMLS and SNOMED CT to confirm applicable to our terms. According to analyses, we think that UMLS and SNOMED CT don't suitable for representing our terms. It is because existing terminologies could not reflect various structures of our terms and include needed terms sufficiently.

Modeling

We made three-level models based on the structure of our terms. The most abstract level is the Meta model. This model consists of Concept, Semantic class, Lexicon, concept relationship, semantic class relationship, term relationship, concept-term relationship (or consist_of relationship), and concept-semantic class relationship (or categorized_by relationship). The conceptual model is more specific than the Meta model. It is divided into the common conceptual model (CCM) and domain conceptual model (DCM). The CCM defines common properties which are applicable to all domains. The DCM defines domain specific properties. The most specific model is the instance model. It generates instances which have properties with real value and consists of skeleton tables and queries. From this model, we can obtain instances and see the integrated vocabulary structure.

DB construction

We made logical and physical schema based on our models, then we constructed DB using Oracle 10G based on these schema. We also developed user interface using Visual Studio C# .NET 2005. Through this, we could confirm our models.

Conclusions

The reference terminology which is used commonly and centrally is a prerequisite for meaningful exchange. For this, we went to work—terms analysis, modeling, and DB construction. In the future, we will develop integrated terminology system suitable for our environment.

Acknowledgments

This work was supported by a research grant of the Korea Health 21 R&D project, Ministry of Health and Welfare of Korea (A050909).

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