Implementation of Interinstitutional and Transnational Remote Terminology Services

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Abstract and objective

Hospital Italiano de Buenos Aires (HIBA) implemented all the necessary changes in order to offer such services to other healthcare institutions, using the Internet as communication vehicle. The most integrated healthcare network of Chile, Megasalud decided to change their legacy system, to develop their own Healthcare Information System (HIS) and started to use Remote Terminology Services (RTS). After the implementation of these Terminology Services we tested the high performance for identifying free text added in their electronic health record, between 78% to 89% of text entered was recognized. The task of creating an institutional interface terminology provides an excellent service to the users, as they have liberty to enter information in free-text style. The aim of this study is to quantify the use of Remote Terminology Services (RTS) provided by the HIBA through a transnational and interinstitutional implementation.

Keywords:

Medical records systems, Natural language processing, Software, Vocabulary controlled, Systematized Nomenclature of Medicine.

Methods

The terminology server of HIBA is composed of a local interface terminology and thesaurus mapped to the reference terminology SNOMED CT. HIBA has developed a local interface terminology in a context of a terminology server with the aim of support clinical documentation and autocode of clinical data in the context of the Megasalud HIS. This interface terminology allowed entering of patient information directly into computer programs, such as clinical documentation systems or decision support tools. When the Electronic Health Record (EHR) is in use, the services provided are *Intelligent Prompting Service, Term Recognition Service, Classification Service*, *Assign Classifier Service.* If the professional selects a term from the list, the application records the corresponding code (Thesaurus code), concluding the registration process. Using this mechanism it is possible to select the classifier ICPC-2 for the epidemiological analysis from a problem list of the outpatient EHR, ICD-9 CM and ICD-10 for a discharge summary in the inpatient EHR. From a discharge summary coded in ICD-9 CM it may apply the *Assign DRG Service* to obtain the corresponding code. An alternative implementation for free text entry is the creation of a structured entry interface based on lists. The EHR application must request the *List Domains Service*. Once the physician selects the domain, the application must request the *List Domain Elements*, which will provide a complete list of terms, allowing a selection. The implementation was carried out in two stages, the start-up and the real time utilization of RTS.

Results

Start-up performance: The amount of clinical data stored in the legacy system of Megasalud (representing ten years of use of that system), that were enabled to be processed by the RTS were 14.120.751 single text phrases. With the batch processing of these data, the RTS recognized and autocoded 11.118.760 (78.74%) texts (included valid and not valid text), and did not recognized 3.001.991 (21.26%) of the original data.

General real time performance: In the period between March 1st to October 1st of 2009 the physicians at Megasalud entered 592.249 pieces of text in the problem-oriented EHR, 530.897 (89.64%) of them were successfully recognized in the interface terminology of Megasalud by the utilization of RTS in real time. The reminder 61.352 (10.36%) are pending the audit process and manual modeling.

Conclusion

The use of Terminology Services via the Internet will enable healthcare institutions to quickly implement a complex and comprehensive solution for their coding issues. Institutions will be able to enhance their own HIS by providing functionality that will be simple and intuitive to health care professionals. Since the implementation, participating institutions have had an extensive vocabulary for the star-up and were provided with close to a decade of continuous maintenance and updating. They are now able to have an independent vocabulary supported by a highly trained staff working at the Terminology Area of the Department of Health Informatics at HIBA.