

# SMTS: a French Health Multi-terminology Server

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## Abstract

*In the health sector, practically as many different terminologies exist as there are fields of application. Hence, and given the growing need for cooperation between health practitioners, a new "interoperable" terminology base is now required featuring a shared semantic frame of reference to enable the various terminologies to interact effectively. The result is an operational multi-terminology server integrating homogeneously nine of the usual health French-language terminologies*

## Introduction

In the health sector, practically as many different terminologies exist as there are fields of application. They are, for the most usual: SNOMED for clinical data, ICD-10 for epidemiological data, ICPC for family physicians, CCAM (in France) for medical procedures, MeSH for scientific literature, ATC for drugs, MedDRA and WHO-ART for adverse effects, and LOINC for biological data.

Hence, and given the growing need for cooperation between health practitioners, a new "interoperable" terminology base is now required. This means, the development of a shared semantic frame of reference to enable the various terminologies to interact effectively, with a minimum loss of meaning.

From our point of view, semantic interoperability needs a common model to represent terms, whatever their terminology of origin, or the ways to relate terms of one terminology to its direct or indirect equivalents in other terminologies.

The goal of this work is to create a multi-terminology server for health terminologies available in French (SMTS French acronym). To do so, two academics teams (LERTIM, CISMef) and a private company (MONDECA) have set up a partnership.

## Material and Method

In the first stage, we designed a model and parsers to generate OWL for the following terminologies: ICD10, CCAM, SNOMED 3.5, ICPC, ICF, DRC, MeSH and CISMef (an extension of MeSH). Above all these terminologies model, a generic model was also created. Once validated, this general model was merged with the model of the ITM<sup>®</sup> platform (MONDECA) for implementation.

Such an approach combine the advantage to respect original structure of every terminology included in the STMS and the use of common metadata. The original model of each terminology is linked to other models of other terminologies via few items of the generic model. Therefore, the maintenance of each terminology does not deeply interfere. This make also easy to integrate new terminologies in the system.

The model allows benefit from inheritance mechanisms since the most generic entities are preserved, notably the following recurrent notions: "descriptor", "hierarchical relation" (BroaderTerm-NarrowerTerm), "see also relationship" (RelatedTerm), "Label", and "synonymy" (UsedFor). It also allows benefit from explicit links and relationships that exist between terminologies.

## Results & Discussion

Parsers were designed and implemented to translate each terminology from its original representation to an OWL formatted file necessary for its integration into ITM<sup>®</sup>. Presently, SMTS integrates about 200 classes, and several hundred of thousands of objects.

The result is an operational multi-terminology server (SMTS) integrating homogeneously nine of the most frequently-used French-language health terminologies. The schema bellow presents its integration in three-tier architecture able to deliver services to software applications.

The next stage is aimed to incorporate other French-language terminologies, e.g. LOINC for laboratory data (as the French translation becomes available), the Orphanet terminology of rare diseases, and the unified drug thesaurus that the French pharmaceutical publishing company Vidal SA is currently constructing.

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The three-tier architecture of SMT

