

# Semantic Interoperability in Czech Healthcare Environment Supported by HL7 Version 3

M. Nagy<sup>1</sup>, P. Hanzlíček<sup>1</sup>, P. Přečková<sup>1</sup>, A. Říha<sup>1</sup>, M. Dioszegi<sup>1</sup>, L. Seidl<sup>1</sup>, J. Zvárová<sup>1</sup>

<sup>1</sup>Center of Biomedical Informatics, Institute of Computer Science of the Academy of Sciences of the Czech Republic, Prague, Czech Republic

## Summary

### Objectives

The data interchange in the Czech healthcare environment is mostly based on national standards. This paper describes a utilization of international standards and nomenclatures for building a pilot semantic interoperability platform (SIP) that would serve to exchange information among electronic health record systems (EHR-Ss) in Czech healthcare. The work was performed by the national research project of the „Information Society” program.

### Methods

At the beginning of the project a set of requirements the SIP should meet was formulated. Several communication standards (openEHR, HL7 v3, DICOM) were analyzed and HL7 v3 was selected to exchange health records in our solution. Two systems were included in our pilot environment: WinMedicalc 2000 and ADAMEKj EHR.

### Results

HL7-based local information models were created to describe the information content of both systems. The concepts from our original information models were mapped to coding systems supported by HL7 (LOINC, SNOMED CT and ICD-10) and the data exchange via HL7 v3 messages was implemented and tested by querying patient administration data. As a gateway between local EHR systems and the HL7 message-based infrastructure, a configurable HL7 Broker was developed.

### Conclusions

A nationwide implementation of a full-scale SIP based on HL7 v3 would include adopting and translating appropriate international coding systems and nomenclatures, and developing implementation guidelines facilitating the migration from national standards to international ones. Our pilot study showed

that our approach is feasible but it would demand a huge effort to fully integrate the Czech healthcare system into the European e-health context.

### Keywords

information storage and retrieval, Electronic health record, HL7, semantic interoperability, communication standards

### DOI

10.3414/ME09-02-0018

The full English version can be found in /Methods of Information in Medicine 2010 49 2: 186-195/ or <http://www.schattauer.de/de/magazine/uebersicht/zeitschriften-a-z/methods/issue/special/manuscript/12381/show.html>.