Developing JPA-based applications using HL7 and SNOMED CT standards with code generation

Gábor Antal[a], Ádám Zoltán Végh[b], Vilmos Bilicki[c]

University of Szeged, Department of Software Engineering
[a]antalg@inf.u-szeged.hu
[b]azvegh@inf.u-szeged.hu
[c]bilickiv@inf.u-szeged.hu

Abstract

Integration of healthcare systems is very important to support effective communication between participants of the healthcare domain. However some heterogeneity problems can make the integration very difficult. Therefore it is very effective to use health information technology standards during the development of healthcare applications because new standardized systems can easily communicate with other systems using the same standard. One of the most important health IT standards is HL7 (Health Level 7) [1] which aimed the standardization of data structures used in clinical messages and documents. The SNOMED CT [2] standard aimed the unification of healthcare terminology which can be used as a lexical standard for HL7 data structures. Another perspective of development can be the usage of code generation tools to increase development efficiency. Therefore it is important to examine the generation of standardized application components. The main goal of this paper is to demonstrate a methodology for developing JPA-based (Java Persistence API) [3] applications using the HL7 and SNOMED CT standard and code generation support. The methodology is capable to eliminate the structural disadvantages of the HL7 standard using a middle layer with simplified entities and automatic conversion between entity layers. Therefore the code generation tools can be more effective to automatically generate some specific components of healthcare systems from the simplified entities. This methodology was successfully used in a HL7 aECG-based (Annotated ECG) [4] web application for collecting and visualizing ECG measurement data.

Keywords: healthcare systems, integration, health IT standards, code generation.

References

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