Implementation of Specification and Description Language for a Health Information System

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Abstract. The tool presented enables medical researchers and clinicians to specify, describe and analyse health information system. Assuming that elements manipulate by the system are domains, events, entities, processes made (activities) and duration. The behaviour of the system based on activities can be precisely specified and verified, mainly by means of simulation. The usage of virtual medical activities led the potential to compose them, to detect their incoherence and to complete them. In addition, concerning already realized medical activities, the tool allows to represent and to analyse the biomedical discourse in such away to provide these information for decision support system.

Keywords. Medical Informatics software, specification, description, language, medical activities

Introduction

As we know medical informatics is calling to provide technologies to help the organization, analysis, management, and use of information in health care. Thus, today medical software becomes a real challenge in field of software engineering and others related technologies of computer science, due to complexity of problem arise in the medical domain. In particular, many tools proposed allow professionals in medical industry to quickly making diagnosis and treatment decisions.

The motive of this research is to materialise my previous theoretical research on the specification and description language of health information system.

The tool presented, called SDL2009, enables medical researchers and clinicians to specify, describe and analyse health information system. Assuming that elements manipulate by the system are domains, events, entities, processes made (activities) and duration. The behaviour of the system based on activities can be precisely specified and verified, mainly by means of simulation. The usage of virtual medical activities led the potential to compose them, to detect their incoherence and to complete them. In addition, concerning already realized medical activities, the tool allows to represent and to analyse the biomedical discourse in such away to provide these information for decision support system.

This paper describes how I have implemented the specification and description language   [1].

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1. System Description

The software is composed of two components namely: Component acquisition cases and specification of the problem and component description of the problem.

The component acquisition cases and specification is capable of analyzing a medical content (case report). It proceeded by elimination of stopwords, inventory of all the remaining words and write these words to a list of standard indicators, calculating the frequency of each of these words. The component description problem allows to define medical activities on interval temporal points with causal relation expressing their links.

The description problem concern: domain, event, entity, activity, equipment, Medication Administration and duration.

The domain defines the space problem and gives the general category. In SDL2009, there is a limited set of domain. A user can add new domain by clicking on the label domain, or can choose some of domains listed by tick of a related box.

The event is an elementary action that is performed in a given event. In SDL2009, there is a limited set of events. A user can add new event by clicking on the label event, or can choose some of events listed by tick of a related box.

A domain is composed of entities that interact on trigger events and reflect the dynamic nature of these activities. In SDL2009, there is a limited set of entities. A user can add new entity by clicking on the label entity, or can choose some of entities listed by tick of a related box.

The activity is expressed as a sentence and contains a meaning. In SDL2009, there is a limited set of activities that can be related to procedures, protocols, organisms, anatomical structures, biologic functions and chemicals. A user can add new activity by clicking on the label activity, or can choose some of activities listed by tick of a related box.

In physical examination, the equipment helps the physician to collect a systematic basic data related to a patient. In SDL2009, there is a limited set of equipments. A user can add new equipment by clicking on the label equipment, or can choose some of equipments listed by tick of a related box.

The medication administration gives the drug form and the route of administration. In SDL2009, there is a limited set of medications. A user can add new medication by clicking on the label medication, or can choose some of medications listed by tick of a related box.

The duration is to know 'how long time?' that allows for the timing of activities.

2. Discussion

While implementing a tool for specifying and describing of medical activities, I have learned that the first component is very limited to provide a lexical analysis without no semantic analysis. I believe that next version of the tool can easily incorporate the semantic analysis in order to manage in depth an adaptive medical ontology linkable to language such as UMLs. The second component provides artefacts of general concepts which actually occur in medical activities. We believe again to enrich it with other related concepts in next version of the tool.

References

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