

# Applying visualization to support coherent terminology implementation

Anne Randorff Højjen<sup>a</sup>, Kirstine Rosenbeck<sup>a</sup>, Pia Elberg<sup>a</sup>

*<sup>a</sup>Department of Health Science and Technology, Medical Informatics, Aalborg University, Denmark*

## Introduction

In every corner of the health sector there is a need for information to be captured, shared and retrieved. A wide range of information is to be exchanged between the various IT-systems within the health sector, such as information concerning the patient's medical case history, information's from other departments and cross sector information. The accessibility of information is important for the treatment and care of a patient. Further, the ability to compare clinical information is a necessity for generating clinical overviews and statistics.

However, one of the greatest challenges when considering data communication in health care is multiple definitions of the same concept. [1] Therefore, use of standardized clinical terminologies is a prerequisite in the quest of achieving semantic interoperability.[2] However, ambiguous and inconsistent use of terminology can hinder data for being shared and therefore to be reused.

It is a fact, that the IT-systems are continuously adjusted and refined. Concepts are being added and resigned to fit the current information needs. Therefore, it is of great importance to maintain a reliable overview of the concepts within the systems to know what concepts are already being used so that added concepts conform to the existing.

The objective of this study is to clarify the needs for a tool that can support a coherent SNOMED CT implementation and to specify these needs in a system design.

## Materials and Methods

This paper is based on results from a clinical implementation of SNOMED CT. The terminology was implemented alongside the configuration of an EHR system in the Northern Jutland Region in Denmark. The point of departure is the configuration of two EHR- templates "nursing status" and "physical examination".

Alongside with the implementation process the authors of this paper manually developed visualizations of the concepts involved in the respective EHR-templates. The visualization was based on the concept structure of SNOMED CT. The visualization was then used as underlying basis for terminological discussions between the end-users (clinicians) and the implementation team, leading to content-refinement for the respective EHR-templates.

The experience from this work was evaluated by the authors and system demands was clarified and specified in an implementable system design.

The basic idea is to visualize a set of concepts included in a set of EHR- templates and to illustrate their relationships relative to the complete SNOMED CT structure.

## Results

The result of this project is a system design and a software prototype that support a SNOMED CT implementation process.

It is found that visualization can support the terminology implementation in clinical IT-systems at different levels. It provides an overview of the concepts applied in the clinical IT-systems, thereby giving an overview of the options available to make specific filtrations (data requests). Also, it can support the selection of concepts that is applied to the IT-system.

## Conclusion

This work is about how to approach SNOMED CT implementation in clinical information systems to facilitate reuse and comparability of information across systems.

To rely on a common terminology system is of course the first step towards facilitating clinical data exchange between IT-systems. However, it is necessary to approach the terminology implementation coherently and with consistency to obtain comparability of information. Also, the IT-systems should apply mechanisms that conform to the reference model of SNOMED CT. Otherwise, the relational properties of the concepts cannot be maintained, and thus complicating the possibility to create advanced retrieving functionalities.

Future work is to validate the system design and to test the potential of terminology-visualization in different scopes of SNOMED CT- implementation.

## References

- [1] Rasmussen AR, Rosenbeck K. SNOMED CT implementation: implications of choosing clinical findings or observable entities. *Studies in health technology and informatics* 2011;169:809-813.
- [2] European Communities. *Semantic Interoperability for Better Health and Safer Healthcare*. 2009.

## Acknowledgments

This research is part of our PhD-studies that are co-financed by Region Northern Jutland, CSC Scandihealth and Trifork A/S.

## Address for correspondence

Anne Randorff Rasmussen, Fr. Bajers Vej 7 C1-, DK-9220 Aalborg Ø, [arra@hst.aau.dk](mailto:arra@hst.aau.dk).