

# Flexible Information Storage in MUDR<sup>II</sup> EHR

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An important research task of the European Centre for Medical Informatics, Statistics and Epidemiology – Cardio (EuroMISE Centre – Cardio) is the applied research in the field of electronic health record (EHR) design including electronic medical guidelines and intelligent systems for data mining and decision support [1]. The research in the field of data storage and data acquisition was inspired by several European projects, mostly by the I4C and TripleC projects. Based on the experience gathered in cooperation in those projects we have proposed a mathematical meta-description of a flexible information storage model. In this model we use two basic structures called knowledge base and data files. The main function of the knowledge base is to store the hierarchy of the collectable features – medical concepts – and relations among them. This varies in different departments, organizations and also during time, therefore a dynamically extensible and modifiable structure is needed. The data files are used to store the patient data itself. These two structures we describe using the graph theory concepts. Furthermore, we use logical formulas to express conditions that should be valid. Additionally, we present a description of a global system architecture of a 3-tier EHR application with interfaces based on the latest technologies; predominately on Web Services, SOAP, XML, HTTP, etc.

We have tested the functionality of our solution implementing a pilot EHR application named “MULTimedia Distributed Record” (MUDR) [2]. Our interest is to increase the quality of EHR systems, to simplify data sharing and data migration among various EHR systems and to help in overcoming the classical free-text based health record. According to our experience and test results gained from the MUDR EHR usage we describe an open universal solution MUDR<sup>II</sup>, which can be applied as the EHR kernel of hospital information systems. To give publicity to our solutions we negotiate with two companies about the application of our EHR kernel in their information systems used in the Czech Republic.

## References

- [1] Rauch J.: Mining for Statistical Association Rules. In: Fong J., Ng M.K. (eds.): The Fifth Pacific/Asia Conference on Knowledge Discovery and Data Mining, University of Hong Kong (2001) 149-158
- [2] Zvarova J., Hanzlicek P., Spidlen J.: Electronic Health Record in Cardiology: Pilot Application in the Czech Republic. In: MIST2002 Proceedings, Taiwan, John Wiley & Sons Pte Ltd. (2002) 10-13