

Towards complex queries on data from complex patients

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Abstract

Health advancements in recent decades have resulted in longer life spans and increased access to medical services for larger populations; Electronic Medical Records have been created by computer scientists to manage this massive amount of collected health data. This ever-increasing clinical data must be processed with complex and sophisticated methods to ensure its ease of use, efficient accessibility, and usability within health care settings. In this poster, we present solutions planed in the French project RAVEL (Retrieval and Visualization in Electronic Health Records).

Outline of the poster

We are facing a growth of patients who live longer and with higher disease burdens which require complex medical treatments and monitoring. Due to advancements in Information Technologies, a greater amount of these medical data are collected and stored within Electronic Health Records (EHRs). These EHRs contain a large variety of heterogeneous clinical data, structured or even indexed with various medical terminologies. However, a large amount of health data are still recorded as unstructured and narrative documents (e.g. observations, discharge summary reports)¹. These data convey different informational and decisional values for healthcare professionals. Nevertheless, the sheer mass and diversity of collected clinical data can lead to the risk of information overload for healthcare actors. It has been observed that about a third of doctors time is spent on recording and synthetizing clinical information, while a third of hospital costs are spent on personal and professional communication between the healthcare actors².

It becomes therefore essential to provide robust and efficient retrieval and visualization tools for EHRs data with the purpose of synthetizing the crucial information for a rapid and efficient decision making . This is the aim of the French national project RAVEL (Retrieval And Visualization in ELeCtronic health records) launched in January 2012. The RAVEL project develops methods relying on the exploitation of the semantic content of the EHRs and on solving interoperability issues between the different references terminologies used to encode EHR data. Our hypothesis is that although data from complex patients may come from various EHR systems and external sources, they can still be efficiently managed. The heterogeneity of this data can be addressed with a dedicated data-warehouse managing both EHRs data, enriched through a semantic indexing processes, and the various reference terminologies as well as their identified mappings. This approach has the advantage of being independent from a specific type of patient EHR: it ensures the portability of information retrieval over the patient data. Finally, special attention is paid to the methods provided for the ergonomic visualization of the information. The RAVEL data repository and prototype will be deployed in the Bordeaux and Rennes regional hospitals following a set of predefined usage cases. An evaluation will be conducted to assess the improvement of patient care through the enhancements offered by this project.

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