Semantic Interoperability and Health Records

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Abstract. Systems Interoperability and Electronic Health Records are responsible for an exponential number of visits in electronic repository, either in terms of medical professionals or related staff. This is paramount for a better and sustainable quality-of-care in clinical assistance and of great potential to medical research. Following these lines of though, we present an agency for the diffusion, integration and archiving of medical information, and show how semantic web can enforce the use of electronic documents in order to envisage free-paper hospitals.

Keywords: Semantic, Interoperability, Electronic Health Record, Information Systems, Healthcare.

1 Introduction

Healthcare is turning into a science based on information and reputation [1]. In the last decade, information systems in healthcare have gained great importance and have grown in quality and in quantity. EHR is a repository of information concerning an individual in an electronic format, stored and transmitted securely and may be accessed by multiple users [2]. The main objective is to ensure ubiquity; i.e. information is accessible at anytime and anywhere. Demands of information handling within the healthcare sector range from clinically valuable patient-specific information to a variety of aggregation levels for follow-up and statistical and/or quantifiable reporting. On the other hand, semantic interoperability between healthcare providers is a hard task [3].

Researchers in the field of Hospital Information Systems (HIS) have focused special attention to the field of quality of information. A Health Unit is computationally represented by a heterogeneous set of applications that speak different languages and are customized by different customers. So a practical and effective communication platform between information systems is paramount taking into consideration the quality of information [3,4].

The EHR semantization is one of the latest advances, in the field of internal and external interoperability. With the inclusion of the Semantic Clinical Process it will be possible to guarantee the management of large flows of information while preserving quality, improving clinical practices and guarantying access to information over the paraphernalia of existing applications in the health unity.

2 Implementation

In order to fulfill this goal, it was developed, at University of Minho, an Agency for the Integration, Diffusion, and Archive (AIDA) of medical information, which allows interoperability with different HIS [4], and a EHR system.

Integration of the information from the different departments and services within healthcare institutions in order to make it available for the EHR system is also an important requisite for an efficient EHR. The electronic ordering embedded in EHR can be used not only to obtain medical equipment or pharmacological prescriptions, but also for acquiring laboratory and imaging studies outside the service where it is used. Furthermore, it may enable the centralization of exam display, allowing different services to share results concerning the same patient, diminishing costs on unnecessary exams, and above all, improving the quality of service being provided.

3 Conclusions

Semantic, a key word in our work refers to a computational paradigm that allows for interoperability, enabling intelligent ubiquitous computation and communications in order to increase quality of information and decision support. Indeed, doctors gather dissimilar types of information about patients for clinical practices. Different types of tests are visited in a user-friendly, including physical exams, imaging tests (e.g. XR, CT or MRI), laboratory tests (e.g. blood, urine, fluids or tissues), or pathology and surgical reports, i.e. in Computational Science, the scientific problem must be expressed mathematically, known as the Algorithm. Using semantic web, the algorithm is translated into one or more computer programs and implemented on one or more types of hardware. In our work, the combination of software and hardware is referred to as the Computational Architecture, the AIDA agency referred to above. It is shown that user-friendlier interfaces have a high number of visits, reducing costs and increasing the quality-of-care.

References

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