Chapter 72
An Approach for the Semantic Interoperability of SNOMED: Improving Quality of Health Records

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ABSTRACT

The semantic and syntactic interoperability introduces the capability of two machines to communicate and understand each other improving then the quality of Electronic Health Records. In this work, is presented an independent application of the medical record, using a web service (with protocol TCP/IP) capable of provide human interaction with interfaces in different devices (web, android app., browser). SNOMED CT is a comprehensive and scientifically validated health care terminology resulting in an organized computer processable collection of medical terms. This can be mapped into other systems of codes like ICD also used in our application. A data base (SNOMED codes and relations) was created capable of answer to all sort of queries from the users using the browser or the mobile application. The first hospital unit to enjoy this system was the pathological anatomy unit of the CHAA hospital. Here after receiving a "piece" and a task, the responsible performs all kind of procedures with the purpose of performing a report (diagnosis for example). With the implementation of SNOMED CT, to produce reports a physician could search for the name of the "piece" or the code and immediately upload in that patient HER the diagnosis. The usage of this codes leads to report uniformed that could be read and understood around the world. Another important feature of the application is the incorporation within the AIDA, AIDA-PCE and AIDA-BI. Experiments with real user show a successful software implementation judging by the utilization rate and medical personal acceptance. The mobile application should suffer an upgrade allowing the patient usage for example.

DOI: 10.4018/978-1-5225-0571-6.ch072

INTRODUCTION

Health information Systems (HIS) refer to any system that captures, stores and manages or transmits information related to the health of individuals or the activities of organizations within the health sector. Since the 60's this systems suffered an intense transformation alongside the technological evolution. According with the World Health Organization (WHO) (World Health Organization, 2008):

The health information systems provides the underpinnings for decision-making and has four key functions: data generation, compilation, analysis and synthesis, and communication and use. The health information systems collects data from the health sector and other relevant sectors, analyses the data and ensures their overall quality relevance and timeliness, and converts data into information for health-related decision-making.

While some people think the purpose of this systems is only for monitoring and evaluate, the reality is much different. It's true they are essential in booth that fields but also they server broader ends, providing alerts for capability, supporting patient and healthcare facility management, enabling planning, supporting global reporting and underpinning communication of health challenges to diverse users (World Health Organization, 2008).

A strong HIS is the backbone of a strong health system getting the right information into the right hands at the right time, enabling policymakers, managers, and individual service providers to make informed choices about everything from patient care to national budgets (Duarte, et al., 2010). They represent a hospital subsystem of socio-technological development that covers information processing, resources, flows and people (Duarte, et al., 2010; The International Health Terminology Standards Development Organisation, 2012))

The Electronic Health Record (EHR) is a digital version of patient´s clinical sheet working like a real time centered record making information available almost instantly to authorized users (The International Health Terminology Standards Development Organisation, 2012).

An electronic health record systems goes beyond the standard medical history and patient history. This systems can contain patient's medical history, diagnoses, medications, treatments plans. Allows the access to evidence-based tools that can be used to infer decisions about patient's care (The International Health Terminology Standards Development Organisation, 2012). Perhaps the key feature of an EHR is possibility of share health information in a digital format across more than one health organization.

The use of techniques that allow expanding the structured and uniformed data throughout the EHR has been increasing, resorting in mechanisms that seek to facilitate the data collection and analysis (Chute, Cohn, & Campbell, 1998). The user of standard terms and concepts in medical records is one of most important tools in this field. This data standardization involves the underlying terminologies like classifications and nomenclatures.

Furthermore, the standardization of health records ensures a better communication between health professionals and the interoperability between systems, allowing the automation of the hospital records. The standards are divided in clinical information representation standards, communication standards and image standards. Its use ensures that the EHR is understood by any health professional anywhere, also allowing the machines to interpret symptoms and assist physicians in diagnosis and treatment (Duarte, et al., 2010; Duarte, Portela, Abelha, Machado, & Santos, 2011).