

## Chapter 23

# Steps towards Interoperability in Healthcare Environment

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### ABSTRACT

*Information should be accessible everywhere and at any time to help with clinical decision and be available for clinical studies through data computationally interpretable. This work is based on a set of studies performed at Centro Hospitalar do Tâmega e Sousa. An Electronic Semantic Health Record was formalized and implemented which was delivered through a platform named Agency for the Integration, Diffusion and Archive, which is supported by intelligent agents. Furthermore, to strengthen the relation between the patient and the hospital, an appointment alert system was developed, which allowed the reduction of non-programmed misses and a decrease of costs. Finally to promote user's confidence on Information Systems, an open-source tool was developed that enables the scheduling of preventive actions. These tools allowed continuous improvement of systems and are currently well accepted inside the healthcare unit, proving in real clinical situation the effectiveness and usability of the model.*

### INTRODUCTION

Currently, information exchange among people, companies and systems plays an essential role in society. In this paradigm, the organization of society depends upon a method of social and economic development where information, as a means of creating knowledge, plays a fundamental role in the production of wealth and contributes to the wellbeing and quality of life of citizens. A healthcare facility is not exception and has to adapt to constant advances in technologies and systems in order to produce knowledge by data and ensure quality treatment to patient.

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## ***Steps Towards Interoperability in Healthcare Environment***

Nowadays, exchange and share of clinical information among Information Systems (IS) is becoming one of the main ways to improve the quality in the services provided to patients. Nevertheless, one of the principal obstacles to accomplish this goal is the high number of heterogeneous information sources arising inside a healthcare facility, such as medical applications and software, medical equipment and even clinical staff self-knowledge introduced as needed in the Patient Clinical Record. As defined by Langefors, IS, are a technologically implemented medium for recording, storing, and disseminating linguistic expressions, as well as for drawing conclusions from such expressions (Langefors, 1975). In a healthcare unit it is easy to step into proprietary applications from a wide range of providers, each one talking its own language and its own philosophy and implementation method, treating information according their own thoughts and workflows. This increases complexity to Health Information Systems (HIS), which depends not only on the number of systems but also on the number of providers. Building up all the information and make it readable by physicians has become a high important task. Therefore, HIS are integrated computer-assisted systems to store, manipulate, and retrieve healthcare administrative and clinical data (MeSH, 1987).

Every day in clinical practice, decisions are made that can save human lives. Clinical decisions are taken based on medical records made electronically or by hand in paper, medical examinations, and physical evaluations having the close contact with the patient. Not only the clinical diagnostic is produced taking in consideration all the information available and considered useful by physicians, but also the drug prescription or pathology identification.

Information is spread through healthcare units and it is almost impossible to avoid the creation of information silos. These silos can lead to data loss or even worst can restrict access to important information that could change or interpose clinical diagnosis. Drug allergies or examination reports that the doctor could not have access to may lead to bad patient treatment and medical errors based on incomplete or mistaken information. Interoperability is one of the keys to overlap these constraints and promotes better and easier access to information (Peixoto, Machado, Abelha & Neves, 2010).

On one hand, Interoperability among systems is one common interest within scientific community and several works are being published every day, about the methodologies of implementation and the ways to achieve it. On the other hand, accomplishing such task requires hard work and it is not yet established the best or only way to reach full interoperability.

Healthcare facilities can take advantages from Interoperability, and homogeneity among IS can lead to time reduction in diagnostic and appointments, since physicians have access to relevant information when and where they need it the most. In addition, it also provides better information quality by single patient identification and correct association between all the IS. In the end interoperability may help decreasing medical errors on treatments based on reliable information and results (Miranda, Duarte, Abelha, Machado, & Neves, 2009).

The Health Information Technologies adoption trend by healthcare organizations is unstoppable. However it is expected to be a backlash in view of the current financial crisis. Negative impact on the growth of the Health Information Technology industry is currently underway as hospitals and health systems are taking measured but deliberate action by delaying capital projects, cutting capital and operating budgets, and lying off workers (Sullivan, 2009).

Many of the European guidelines are sustained by Open-source software, which first perceived advantage is the fact that they are made available free or at a low cost, where developers should focus on sharing and complete systems in an open, widely spread and accessible way. Taken globally, several healthcare facilities with the same goals can share information and aims and fight together to improve sustainability for HIS in the Global Economic Crises (Sullivan, 2009).

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