Chapter 2
Standards Related to Interoperability in EHR & HS

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ABSTRACT
The standardization of clinical data represents a major step in the development of information and organizational knowledge of health services. The evolution of information systems from a model of different database owners to a different open software based model is a major challenge. For this reason it is essential to adopt models of metadata based on archetypes to improve the development of information systems and simultaneously integrate all applications. The adoption of clinical terminology that can translate existing knowledge and enhance its growth is a necessary goal. Accessibility, ubiquity, completeness, consistency and durability of the clinical data are essential objectives for efficiency and effectiveness gains in organizations. This chapter presents the concepts and technologies needed to implement a model of EHR (Electronic Health Record) based on a standard, open architecture. It also presents some concepts of decision support systems and business processes that can be integrated with the EHR.

INTRODUCTION
A knowledge of Information Systems in healthcare leads to an increase in the wealth of societies and an improvement in the quality of life.

“Health” according to the Merriam-Webster Dictionary (n. d.) is “the condition of being sound in body, mind, or spirit; especially: freedom from physical disease or pain.” The WHO (World Health Organization, n. d.) defines “Health” as a “state of complete physical, mental, and social well-being and not merely the absence of disease, or infirmity.”

The use of ICTs (Information and Communication Technologies) in the areas of health has been slow as a result of two factors:
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- Some conservatism;
- Great complexity of healthcare associated with its constant evolution.

It is common to hear doctors note, for example, that their profession is a mix of science and art. Actually the number of variables to consider in the provision of healthcare is enormous and difficult to integrate. For this reason the automation of workflows, the definition of data models and development of knowledge databases are complex and difficult to construct. Another issue is that until now it has not been possible to develop systems entirely appropriate to the requirements of this area. According to Downing (2007), healthcare must be safe, effective, patient focused, timely, efficient and equitable. Patterson (2004) states that we are moving towards a knowledge network society.

The main advantage of Information Systems concerning digitized clinical data is the fact that Health professionals are not interested in looking at data but in building up knowledge from it. Many available systems on the market just transform the previous paper records into electronic records.

Another concept emerges from these issues: the concept of e-Health. According to the WHO, e-Health “is a new term used to describe the combined use of electronic communication and information technology in the health sector or is the use, in the health sector, of digital data-transmitted, stored and retrieved electronically-for clinical, educational and administrative purposes, both at the local site and at a distance.”

The ICTs and the creation of knowledge from them are the engine of modern society.

According to Langley and Carol (2007) information systems can improve the quality of Health services in the following dimensions:

- Improving existing resources management;
- Supporting diagnosis and care through additional information being made available in databases;
- Increasing accessibility to clinical data;
- Automation of care processes;
- Increasing communication with the user/patient.

Improving Existing Resources Management

Improving existing resources management will allow better planning of needs in terms of capacity, use and supply. Information systems can also create knowledge based on historical data and support future planning avoiding flaws in answering requests.

Supporting Diagnosis and Care Through More Information Made Available in Databases

One of the great difficulties for doctors is accessing, assimilating and contextualizing the huge amount of information that is produced daily about improvements in medicine. According to Patterson (2004), the fragmentation and simultaneous explosion of knowledge in healthcare systems are not compatible with traditional care methods.

With the advent of the information society, it is possible to develop systems that search, in a permanent, automatic way, available databases on the internet, (called crawlers), and generate local knowledge through the use of data mining. These systems are foundations of knowledge which may be associated with neural networks and they can integrate expert systems to support the decision making process. According to Bergman (2008), the