Chapter 6

Technology in Healthcare

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6.1 Introduction

The term “e-health” was born in 1999 to represent the provision of healthcare services through Internet [11], and was heavily promoted by the industry and commercial sectors in order to take advantage of the power and excitement that other “e-” terms like e-commerce and e-business had recently created in society [8, 6]. Nevertheless, the academic world would soon adopt it, leading to what some authors call “the death of telemedicine” [14].

The term was so wide that anything to do with technology and health was included. In this direction, the European Commission proposed the following definition for e-health [7]: “the use of modern information and communication technologies to meet needs of citizens, patients, healthcare professionals, healthcare providers, as well as policy makers”. In this definition, other disciplines like medical informatics, health informatics or telemedicine would be included.

There are numerous definitions of e-health, as the Figure 6.1 from [13] shows, but most of them reduce to the same basic idea: e-health is the use of ICT for health.

In order to illustrate the multiple applications that e-health embraces, a five layer model is proposed [2, 5], as shown in Figure 6.2. At the base there are two basic layers, the physical infrastructure and the informatic and telematic services layers, both corresponding to the ICT. Those layers support all the basic e-health services which will build the health applications higher up, depending on the particular scenario. Sometimes a health application is based on only one e-health service, which could even coincide with the use case scenario. For example, a remote surgical operation (scenario) will be carried out from the surgery clinical specialty (application), using the e-health service of telesurgery.
6.2 Objectives

Central to all the e-health definitions is that the use of information and communication technology, such as the Internet, is required for long distance delivery of health services. The use of the Internet in e-health is likely to increase as more healthcare organizations switch to broadband Internet connections. Wireless connectivity is also another interesting characteristic that technologies are offering for this particular domain, especially for mobility that will be discussed in the next section of the chapter.

One of the main objectives of ICT in healthcare is achieving the interoperability of medical information systems and Electronic Health Records, by creating a common architecture (middleware) for delivering healthcare services and also collaborative platforms (CSCW) to improve cooperation between different disciplines in the healthcare domain.

The use of ICT is also a key stone to respond to privacy needs related with healthcare, like preserve confidentiality with a high level of security and promoting the use of e-cards in healthcare to facilitate mobility and identification.

Another objective that ICT addresses is facilitating the mobility: develop services that cover every situation we could think of (anyone, anywhere, anytime, anyhow, ...), or walking towards m-health with wireless solutions and portable devices.

Finally, ICT makes easier the management of the huge amount of information