Chapter 29
ICT Applications and Solutions in Healthcare:
Present and Perspectives

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ABSTRACT

This chapter describes and discusses the applications and solutions under development or implemented in the e-Health care systems, in terms of their technological, social, organizational dimensions. A survey of the present status in relation with e-Government covers the leading countries (and not only) in ICT-based developments in these sectors. The authors present the most important solutions regarding the implementation and administration of a wide range of applications. Certain issues concerning EHR (Electronic Healthcare Record Systems), pharmacy and electronic prescription systems, patient administration and financial systems, intensive care unit systems, laboratory information systems, homecare and telecare applications, radiology information systems, and bioinformatics are outlined. Up and running ICT projects according to European Commission policies for health, ageing well, inclusion, and governance (FP7) are also presented.

INTRODUCTION

Essential aspects related to key fields in healthcare are discussed in a concise manner in addition to several perspectives over the next development processes within each field. Definitions and presentations of main areas of action related to information technology are provided. Basic concepts, problems identified, solutions, aspects related to current status and perspectives are outlined.

The chapter is suitable especially for applied health informatics students but also for students of all healthcare professions and others who are training to play an active role in their organization's journey toward a fully functional e-Health system defined and understood as an integrator sum of a wide range of policies, standards, concepts dedicated to the top aspects in creating, maintaining

and developing an integrated, fully functional and easy to use e-Healthcare environment.

The main objectives of the present chapter are to offer a clear image of the actual main areas of development within e-Health concepts from the ITC perspective and, at the same time, to offer, if possible, an overview of the further trends for each ICT health application range. Basically, the chapter is dedicated to a brief but concise introduction to main e-Health concepts. The information provided covers mainly the last decade, focusing on the last years. Current status, problems, solutions, advantages or disadvantages, future trends or new advances are described for Electronic healthcare record systems, Pharmacy and electronic prescription systems, Patient administration and financial systems, Intensive care unit systems, Laboratory Information Systems, Homecare and Telecare applications, Radiology Information Systems, Bioinformatics.

BACKGROUND

Healthcare and social care, regardless of their geographical location and sociopolitical environment, consist of three stakeholder groups (providers, supporting industry and governance) sharing the common aim of providing the best service to a fourth stakeholder group – the patients, as beneficiaries of this service (or consumers). Every stakeholder will have shared (often competing) values, expectations, needs, and challenges, which will finally form the growth drivers – or opponents – to the enablement of a common practice in these services. Improved access to care, improved patient safety, and cost savings are made possible through ICT investment in areas, which have a well-proven business case, such as Electronic Health Records, Clinical Decision Support, Electronic Transfer of Prescriptions, and Chronic Disease Management Systems, all sustained by a modern IT infrastructure. As the world's population is ageing, healthcare system

is facing one of its most important problems: it should support the current and future needs of the population it serves.

Electronic Healthcare Record Systems

Significant automation exists in each of the diagnostic and therapeutic areas, usually based on a best-of-breed basis (so named because departmental managers bought the best component system that they could afford at the time). Electronic Medical Records (EMR) manage the clinical operations of healthcare providers and lie at the center of any computerized health information system. Without EMR, other systems such as decision support systems cannot be effectively integrated into the routine clinical workflow. The multi-provider, multi-specialty interoperable, multi-discipline computerized medical record, which has been a goal for healthcare professionals, administrators and many politicians for the past two decades, is about to become reality in many Western countries.

Worldwide, in North and South America, Europe, Asia/Pacific, Australia and New Zealand sustainable efforts are made to implement integrated EMR systems, each zonal entity usually having its own approach. Important steps to implement national EMR systems are also taken in other East European countries, such as Poland, Czech Republic, Slovakia, etc. In Romania for example, projects over 40 million euro have been recently granted from EU grants (Vasilache, 2011), in order to implement the electronic prescription (deadline 2011) and electronic patient data sheet (deadline 2012).

Related terms to EMR that can be used both interchangeably and generically include Electronic Health Record (EHR), Electronic Patient Record (EPR), Computer-Based Patient Record (CPR), etc. Even if these terms are quite different, these differences have no impact over their general use. Whilst EHR provides a longitudinal record of a

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