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

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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 introduc-
tion 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 prescrip-
tion 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 geo-
 graphical 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 ben-
eficiaries 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 diag-
nostic 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 Zea-
land sustainable efforts are made to implement
integrated EMR systems, each zonal entity usu-
ally 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