

# Chapter 8.1

## E-Health Systems: Their Use and Visions for the Future

**Pirkko Nykänen**

*Tampere University, Finland*

### ABSTRACT

E-health refers to use of information and communication technologies to improve or enable health and healthcare. E-health broadens the scope of healthcare delivery; citizens are in the center of services and services are offered by information systems often via the Internet. In this chapter e-health systems are classified on the basis of their use and their functionality and the use is discussed from the viewpoints of citizens and health professionals. Citizens are increasingly using Internet and e-health systems to search for medicine or health-related information, and they become better informed and may take more responsibility of their own health. Health professionals are more reluctant to use the Internet and e-health systems in physician-patient communication due to the power and responsibility problems of decisions. In the future the sociotechnical nature of e-health should be considered and future systems developed for real use and user environment with user acceptable technology.

### INTRODUCTION

In the information society it is important to develop and apply technologies in such a way that we empower citizens to play a full role. An essential part of the information society, healthcare services are needed by citizens and should be provided efficiently and made accessible to all (Haglund, 2002).

With the information society a new concept, e-health, has been introduced to refer to the use of emerging information technology to improve or enable health and healthcare. Silber (2003) defined e-health as “application of information and communication technologies (ICT) across the whole range of functions that affect health” (p. 3). Eysenbach (2001) gave a broader definition for e-health: An emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. Alvarez (2002) emphasised the consumer-viewpoint when he defined e-health as a consumer-centered model of healthcare

where stakeholders collaborate, utilising ICT and Internet technologies to manage health; arrange, deliver, and account for care; and manage the healthcare system. All these definitions support the conception that e-health means application of information technologies to promote health, and to support healthcare services delivery and use. E-health covers all health strategies: Prevention, treatment, and rehabilitation. It is essential that e-health applications meet the needs of citizens, patients, healthcare professionals, and policy makers. Therefore, evaluation studies are needed to assess the benefits, effects, and impacts of e-health on citizens, professionals, healthcare systems, and healthcare outcomes.

E-health conceptualization broadens the scope of healthcare delivery; citizens are placed at the centre of services, services are in many situations offered to be used through the Internet (e.g., at home) and citizens can have interaction with health professionals who look after their health needs (Silber, 2003; Wilson, Leitner, & Mousalli, 2004). E-health is expected to contribute to development of new ways of delivering health services and to impact on the organisation and structure of the healthcare delivery system. E-health is not only a technological improvement, it is a reengineering of healthcare processes and is of consideration of the sociotechnical aspects of design and development of applications.

### E-HEALTH SYSTEMS

E-health applications should make citizens better informed. All citizens should have access to services, use of services should be economically affordable, and citizens should benefit from the use of services. On the other hand, e-health services should improve the quality, availability and effectiveness of healthcare (Grimson et al., 2000; Silber, 2003; Wilson, 2002).

### Types of E-Health Systems

Traditionally, three broad categories of e-health applications can be identified: Delivery of care to patients by healthcare professionals, education and dissemination of health-related information and knowledge, and trading health products (Ruotsalainen et al., 2003).

The first category covers systems for *delivery of care to patients by healthcare professionals*, including a wide range of applications from pure administrative to those for care delivery:

- **Hospital systems:** Scheduling systems, logistics systems, management information systems, hospital and patient administration systems, laboratory information systems, radiology information systems, pharmacy systems, nursing systems, and networked services such as electronic messaging between the hospital and other healthcare actors for communication of clinical information and administrative data, including telemedical services such as telepathology and teleconsultation for remote areas.
- **Primary care systems:** Information systems for general practitioners, pharmacists, and dentists for patient management, medical records, electronic prescribing, and information exchange.
- **Home care systems:** Systems that are used to deliver care services via telecommunication or wireless to the patient at home. Examples of such systems are remote vital-signs monitoring systems that enable the patient to receive targeted treatment and medication without the need to visit an outpatient clinic or occupy a hospital bed. These kinds of systems are particularly well developed in diabetes medicine, hypertension management, asthma monitoring, and home dialysis.

7 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/health-systems-their-use-visions/26375](http://www.igi-global.com/chapter/health-systems-their-use-visions/26375)

## Related Content

---

### GUI-CAD Tool for Segmentation and Classification of Abnormalities in Lung CT Image

V. Vijaya Kishore and R.V.S. Satyanarayana (2019). *International Journal of Biomedical and Clinical Engineering* (pp. 9-31).

[www.irma-international.org/article/gui-cad-tool-for-segmentation-and-classification-of-abnormalities-in-lung-ct-image/219304](http://www.irma-international.org/article/gui-cad-tool-for-segmentation-and-classification-of-abnormalities-in-lung-ct-image/219304)

### Data Mining Techniques and Medical Decision Making for Urological Dysfunction

N. Sriraam, V. Natasha and H. Kaur (2006). *Handbook of Research on Informatics in Healthcare and Biomedicine* (pp. 154-165).

[www.irma-international.org/chapter/data-mining-techniques-medical-decision/20575](http://www.irma-international.org/chapter/data-mining-techniques-medical-decision/20575)

### Reconstruction of EIT Images Using Fish School Search and Non-Blind Search

Valter Augusto de Freitas Barbosa, David Edson Ribeiro, Clarisse Lins de Lima, Máira Araújo de Santana, Ricardo Emmanuel de Souza and Wellington Pinheiro dos Santos (2021). *International Journal of Biomedical and Clinical Engineering* (pp. 89-103).

[www.irma-international.org/article/reconstruction-of-eit-images-using-fish-school-search-and-non-blind-search/272065](http://www.irma-international.org/article/reconstruction-of-eit-images-using-fish-school-search-and-non-blind-search/272065)

### A WBAN-Based Framework for Health Condition Monitoring and Faulty Sensor Node Detection Applying ANN

Koushik Karmakar, Sohail Saif, Suparna Biswas and Sarmistha Neogy (2021). *International Journal of Biomedical and Clinical Engineering* (pp. 44-65).

[www.irma-international.org/article/a-wban-based-framework-for-health-condition-monitoring-and-faulty-sensor-node-detection-applying-ann/282494](http://www.irma-international.org/article/a-wban-based-framework-for-health-condition-monitoring-and-faulty-sensor-node-detection-applying-ann/282494)

### A Log-linearized Viscoelastic Model for Measuring Changes in Vascular Impedance

Abdugheni Kutluk, Ryuji Nakamura, Toshio Tsuji, Teiji Ukawa, Noboru Saeki, Masao Yoshizumi and Masashi Kawamoto (2011). *Early Detection and Rehabilitation Technologies for Dementia: Neuroscience and Biomedical Applications* (pp. 326-334).

[www.irma-international.org/chapter/log-linearized-viscoelastic-model-measuring/53454](http://www.irma-international.org/chapter/log-linearized-viscoelastic-model-measuring/53454)