

Inventing the Future of E-Health

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INTRODUCTION

E-health involves the use of information and communications technologies to improve health in general and the healthcare system in particular (Alvarez, 2002; Chau & Hu, 2004; Roger & Pendharkar, 2000).

Healthcare, one of the largest industries in the world, suffers from some inefficiencies and inequities in both service provision and quality. Some of these problems are due to the poor management of the information flows (Kirsch, 2002). In this respect, there are business opportunities for e-health. But to understand what the future holds for e-health, we need to find a precise definition of the concept and identify the possible sources of business.

This article is structured as follows. The second section, the background, defines the concept of e-health. The third section outlines some of the business opportunities in the area of e-health based on the communications platform that is the Internet, and discusses some practical guidelines for e-health businesses to create value. The fourth section discusses the low level of adoption of e-health at present, as well as the future trends, in which e-health will presumably grow. e-health is also expected to be used to reduce the disparities in the population in access to healthcare, and for the treatment of the chronically ill. The fifth section is dedicated to the final conclusions.

BACKGROUND

The term *e-health* is relatively recent and refers to healthcare practice that is supported by electronic processes and communications. The term has many definitions, depending on the functions, stakeholders, context, or the theoretical framework referred to. It includes a wide range of medical informatics applications, both specific (for example, decision support systems, citizen health information) and general (for example, management systems, healthcare services provision, etc.). But the increased importance of the communication function in e-health, and the use of electronic networks (particularly the Internet), differentiate e-health from traditional medical informatics (Pagliari, 2005).

Thus, e-health goes beyond healthcare informatics and incorporates the most advanced information technologies to medicine and healthcare. Among the most significant applications of the technologies to healthcare are the following:

- *Electronic Medical Records*, which allow different healthcare professionals to share information about a particular patient.
- *Telemedicine*, which uses information and communications technology (ICT) to enable physician-patient contact at a distance.
- *Evidence-based Medicine*, in which a system updates information about the most appropriate treatments for each patient, thereby enhancing physicians' treatment possibilities.
- *Citizen-oriented Information*, through which citizens are provided with information about health topics.
- *Specialist-oriented Information*, whereby a system distributes information to specialists about medical journal articles, practices and protocols in the area of health, new medical advances, epidemiological alerts, etc.
- *Virtual healthcare teams*, made up of healthcare professionals sharing information about patients electronically to improve their knowledge and decision-making.
- *Health e-commerce*, which involves providing value-added electronic services to both professionals and citizens, and economically exploiting some or all of the services. In this respect, e-health is supported by the Internet and related technologies and combines medical informatics, public health, and business. This type of e-health does not exclude the previous ones. To the contrary, it includes them or complements them. The following section discusses the concept of Health e-commerce, indicating what types there are, what they consist of, and how they obtain their revenues.

Some authors go further than the concepts explained in this section and predict a change of mentality and culture among both citizens and practitioners. One author goes so far as to argue that e-health "...characterizes not only a technical development, but also a state-of-mind, a way of

thinking, an attitude, and a commitment for networked, global thinking, to improve healthcare locally, regionally, and worldwide by using information and communication technology” (Eysenbach, 2001).

BUSINESS OPPORTUNITIES BASED ON E-HEALTH

As we mentioned above, the inadequate management that a large part of the healthcare sector makes of its information flows (Kirsch, 2002) and processes, as well as the new advantages offered by present-day ICT, mean that e-health opens up significant business opportunities.

One of the most notable business opportunities offered by e-health is e-commerce. The most important forms that *e-commerce* can adopt on the Internet include (Parente, 2000): portals, connectivity sites, business-to-business applications, and business-to-consumer applications.

Portals dedicated to health tend to provide all types of information, guidance, and medical advice to consumers and professionals. Portals generally represent starting points for consumers, offering them various online activities as well as diverse information. Their general objective is to be the first place that customers go to when they are looking for something on the Internet. For this, they need to establish a brand that attracts visits and creates loyal customers. Their main sources of income come from the advertising they contain and occasionally from users’ subscriptions.

Sites dedicated to facilitating connectivity in the health-care sector have the objective of linking and integrating the various information systems seamlessly. The income of this business model comes from the company’s external users, who pay fees to obtain information. Health e-commerce connectivity initiatives involve accessing electronic medical records on the Internet, evaluating the quality of providers according to their clinical results, and using quality information in the selection of physicians. For example, some hospitals provide their patients with directories of their physicians on the Internet, which are searchable by

zip code and clinical specialty (Coile, 2000). Because these sites obtain their revenues from the fees generated by each information transaction, their objective is to maximize the number of transactions. These companies obtain transaction fees from health plan providers, physicians, hospitals, clinical laboratories, pharmacies, consumers, and companies offering financial, marketing, or delivery services in the healthcare sector.

Business-to-business (B2B) e-commerce involves selling products and services to other firms on the Internet. The income from this business model comes from the sale of the product or service itself. *B2B Health e-commerce* includes businesses dedicated to selling refurbished medical equipment or pharmaceutical refills on the Internet. Indeed, pharmaceutical refills are a large market with a high turnover, and are ideally suited to be traded on the Internet at competitive prices offering next-day home delivery (Coile, 2000). Apart from the products sold in this way, some companies are now beginning to offer services such as online management consultancy.

Business-to-consumer (B2C) e-commerce sells products and services directly to the consumer via the Internet. As in the previous model, the income comes from the sales themselves. The B2C business model in the healthcare area allows consumers to acquire products and services such as health insurance, prescription drug refills, over-the-counter drugs, medical supplies for the chronically ill, vitamins, homeopathic medicines, and home fitness equipment (Coile, 2000).

Table 1 shows examples of some of the most important firms in the e-health sector. The firms are classified under the business model that most closely matches their main activities or sources of income. But the limits are often hazy, and the firms can often be classified in more than one category.

After the bursting of the Internet bubble it became clear that an e-business, such as one based on e-health, should in the first place be a business venture, and not just a technological one. e-health firms are businesses, and so they must seek to create value. In this respect, some authors offer *practical guidelines to e-businesses* about how to generate value (Earle

Table 1. Examples of business models in e-health

Portal	Connectivity	B2B	B2C
Medscape drkoop.com OnHealth HealthGrades.com	Healtheon/WebMD TriZetto XCare.net Claimsnet.com	Neoforma.com Medical Manager Allscripts eBenx	drugstore.com PlanetRx HealthExtras

Source: Adapted from Parente (2000).

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