Chapter 46
From Healthcare Services to E–Health Applications:
A Delivery System–Based Taxonomy

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ABSTRACT

The increasing adoption of ICT – and especially Internet-based technologies – in healthcare has been very fruitful and has led to the innovative approach to healthcare practice commonly known as e-health. However, the boundaries of this new approach to healthcare are not clear, as it is reflected by the various properties and taxonomies of e-health applications which have been proposed. In this chapter, we first review the definition of e-health and the main taxonomies for its constituents. Then we propose an original taxonomy for e-health applications, based on the structural features of the delivery system of the services which are digitalized: the need for a physical interaction between the subjects involved in the service provisioning and the possibility of delivering the services through Internet-based technology.

INTRODUCTION

The advent of the so-called "ICT revolution" can be undoubtedly considered a turning point in economic history, due to the strong impact it has had on the structure of the economic system and on the way business is done. Many authors – see, among others, Castells (2000), Porter (2001) and Burman (2003) – have theorized the progression from the traditional industrial economic paradigm to the so-called "digital economy", stressing the central role that digital technologies and ICT play in this progression. Underlying this shift in paradigms has been the increasing digitalization of information – that is the process of representing any kind of information as a sequence of *bit*, that is *binary digits* – which has come into conflict with real world processes that remained substantially analog-based (Tocci, 1988) and not always reducible to binary storage. However, modern digital technologies allow for an accurate digitalization of

information from many different sources (words, sounds, images, etc.), with minimum loss of the processed information. In other words, more and more typologies of data and information can be properly turned to the digital format or, in short, "digitalized" (Aldrich & Masera, 1999). If digital technologies have enhanced the possibility of processing information more efficiently and effectively, it is thanks to ICT – and especially to Internet-based technologies – that digital information can be transmitted and shared, dramatically increasing its value and its contribution to economic activities.

This process has certainly involved healthcare services too; in fact, the increasing adoption of ICT and Internet-based technologies in that industry has been very fruitful and has led to the innovative approach to healthcare services commonly known as e-health. With respect to this concept, literature is not consistent, as several definitions have been proposed together with just as many taxonomies and classification schemes. Taxonomy studies does not only help to better understand phenomena, but also provide tools to categorize concepts in a field: indeed a taxonomic tool is one of the basic tools in the development of scientific knowledge, as such systems aid in research by helping to identify unexplored phenomena and providing a context for their relationship with other aspects of the environment (Tulu et al., 2007). At present, proposed taxonomies for e-health activities are quite heterogeneous and allow for just a partial view on such a complex phenomenon. As a consequence, to fully appreciate the origins, the structure and the great potential of e-health applications we propose to trace them back to a more general phenomenon, that is the Internet-driven digitalization of services. Healthcare activities, in fact, are part of the wider area of service industries, which have been deeply changed and redesigned by the possibility of performing their delivery through Internet-based technologies.

The main objective of this chapter is therefore to propose an original taxonomy for e-health activities, built around the characteristics of the delivery system of healthcare services; by doing so, it is possible to understand the way in which healthcare activities evolved towards a new digital configuration and to speculate about their potential future development.

To this purpose, we first place the healthcare industry within a wider framework of the digital economy; then we move to a closer analysis of the e-health construct and components. Afterwards we introduce a classification model for services in accordance with their characteristics and their delivery modes. This scheme is then applied to the healthcare industry, to get to a classification scheme which gathers e-health applications into homogeneous groups built around the features of their delivery systems and, consequently, to the way in which they have evolved towards their new digital structure. Finally, we propose some reflections on future technology-driven trends which could affect the healthcare industry.

BACKGROUND

In this section we first present some considerations on the role of healthcare industry within the new economic paradigm of the digital economy, useful to encompass the e-health development within a more comprehensive framework. A definition for e-health is later proposed, which embraces the most relevant elements of this phenomenon; then, the main objectives associated with the development of e-health are illustrated, to show its great potential in terms of efficiency, effectiveness, innovation and relationships. Finally, the issue of e-health taxonomies is introduced.

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