Market of Resources for Health Care Teleservices Management

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INTRODUCTION

According to a report on e-marketplaces for the health sector (Kuller, 2005), the European Health and Social Services sector is a complex web of "businesses" and "customers," characterized by a combination of public and private providers who control the strategic direction and finances. The services are delivered by microbusinesses, that is, hospitals, clinics, general practitioners, and specialists, and delivered through government, public, or nonprofit bodies, not the private sector (although this is slowly changing in some countries) (Kuller, 2005). The resulting absence of the profit goal means that the motivation for changing business processes and implementing tools is driven by a need to improve "patient care," and not a desire to make or save money. This partly explains why the Health and Social Services sector lags behind others with regard to IT infrastructure in place and e-business usage.

We are currently witnessing an attempt to use in the health sector some solutions already in use by the business sector to optimize processes of product sourcing and supply chain improvement, such as the several well-succeeded "last generation" e-marketplaces (e.g., www.broadlane.com, www.Med2med.com, www.labx.com, www.saniline.com) and many others referred by directories like eMarketServices, available online at http://www.emarketservices.com (eMarketServices, 2007; Zallh, 2005).

But this concept is far from being adopted to improve networks of service providers in the sector, creating true synergies of resources and capabilities for service delivery.

In this article, we discuss the adoption of a model from the business world, in particular, an environment to support virtual enterprise integration that has as its main characteristic the ability to reduce transaction costs while providing increased inter-organizational dynamics between the involved partners and preserving the risks of knowledge leakage. This environment, called the market of resources for agile/virtual enterprise integration, has been deeply explained in the literature (Cunha & Putnik, 2005, 2006a, 2006b; Cunha, Putnik, Gunasekaran, & Ávila, 2005) and is based on the BM_Virtual Enterprise Architecture Reference Model (Putnik, 2001).

The environment or market herein introduced—a market of resources for health care teleservices management—is an environment to coordinate and manage the delivery of teleservices in the domain of health care to elderly people or people with special care needs with no facilitated access to health centers or staying at home. There are no implementations of environments able to promote the match between the delivery of health care teleservices (provided by health care professionals) and the individuals (users or patients) with special needs who are telemonitored according to their problem and, in a particular moment, need the intervention of a professional as a consequence of a variation of a vital signal or by their personal will. This environment contributes simultaneously to overcome distance and rurality, promoting e-inclusion.

BACKGROUND

The March 2000 Lisbon European Council set the objective of making the EU "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion" (European_Commission, 2002). According to the strategy defined by the

European Council in Lisbon, e-health has a clear role in the European Union strategy—eEurope—and is the key to attain a stronger growth and create qualified employment in a dynamic and knowledge-based economy. However, this intention requires specific actions from research and development of new models for application/integration of existing technology, new technological advances, the widespread reach of broadband Internet access to all population (particularly remote areas), specific public health actions, and the problematic issues of integrating the population with special care needs, such as elder people, in the e-health systems.

The e-health tools and solutions that are available today include products, systems, and services that go beyond mere Internet-based applications; these include information networks, electronic clinic records, telemedicine services, personal wearable and portable communication systems, health portals, and a plethora of other information and communication technology (ICT)-based tools that assist in prevention, diagnostic, treatment, monitoring, and lifestyle management.

There have been more than 10 years of research and development in the area of telemedicine and within the framework of the European Information Society Technologies (IST) program. Examples of results include the regional health information integrated networks, normalized electronic health records, reliable and effective telemedicine services (such as home telemonitoring) as well as health support and management personal systems for the population.

Already, in 1999, a patent had been issued to the company Cybercare Inc. for a user-friendly telemonitoring system. The system used voice, video, and data transmission to relay medical information between central and remote monitoring stations, and the company planned to launch a Web platform, the Electronic House Call System, which would monitor terminal patients at their own homes. This platform already envisioned communication between the patient and health care professionals and even among different patients (Versweyveld, 2000).

Around that time (1999-2000), the telemedicine global market was predicted to have an annual growth of approximately 40% for the next 10 years. The main areas included real-time clinical image, remote monitoring through video, telemedicine, and teleradiology. The use of mobile phones as the future support of telemedicine was predicted. Although current reality points towards slightly more complex solutions to make telemedicine viable, the truth is that concept was quite valid.

Still in 2000, the Teesside Medical Computing Centre (TMCC), United Kingdom, was starting to develop one of the first integrated e-health systems, which was in fact an electronic multimedia patient health record specifically designed for telemedicine applications. The system had real-time patient management as the primary goal. In the United States, the Johns Hopkins Medicine (one of the world's largest enterprises in this sector, which already at that time included research and development (R&D) centers, clinics, educational institutions, and industrial companies), launched an initiative which intended to offer its services on a worldwide level, including training of specialists. The plan was in fact to be able to respond to the needs of patients all over the world by employing the most advanced computational means (telephone, video, satellite, wireless). The Lucent Technology company provided all required support (hardware, software, security solutions, etc.) for this task.

It should be noted that unlike Europe, the United States adopted very rapidly the first telemedicine solutions. It was already common in the U.S. about 4 to 5 years ago to have emergency bracelets for elder patients to be able to recover at their homes in low risk situations or after some specific surgeries. It is proven that, in typical cases, patient recovery can be significantly improved in the comfort of their own homes, particularly when they are surrounded by family and friends. The emergency bracelets would not allow clinical data to be sent but simply to quickly call for help in the case of a problem. These bracelets were manually activated by the patient, but their use was proven valuable in several occasions. Note that the device itself was not of considerable commercial value; the emergency transportation system was the real source of income for the companies that marketed the alarms together with that service.

Today, among the numerous commercial telemedicine solutions, we can find:

- The *Heartline* ECG (electrocardiogram) monitoring system from *Aerotel*, which allows ECG signals to be transmitted in an intermittent way through a cell phone to the medical center (Aerotel, 2007).
- The *HomMed Health Monitoring* System from *Honeywell* (2007a) alerts the user up to four times per day and guides him in a simple 3-minute process during which medical information is collected.