

Chapter 14

Health Services through Digital Terrestrial Television

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ABSTRACT

This chapter defines a scenario for providing Health Services through the Digital Terrestrial Television (DTT), both for patients (monitoring health parameters) and healthy citizens. A number of services will be provided over DTT, not only by means of informative or interactive applications broadcast and installed on the set-top box, but also as transactional services through the secure return channel. However, much effort has to be spent to guarantee the usability of that new TV-based interface, which is quite different from that of a PC-based Web application.

INTRODUCTION

Western World is nowadays close to complete the transition toward the digital television, and in particular toward the Digital Terrestrial Television (DTT) (Leiva, 2006). Thanks to the presence of a modem and of a reader of smart cards, decoders can provide a new access for information and services through the secure return (telephonic) channel. The DTT software is based on the open standard called Multimedia Home Platform (MHP) (ETSI, 2003). MHP applications are written in Java and are called “Xlets” (see Morris 2005 for a complete introduction to Interactive TV Standards). They are broadcast by the TV operators inside

the MPEG video stream, so they do not have to be installed on the Set Top Box (STB) and are independent from its operating system, thus being immediately available in every home. After this epochal change, Local Healthcare should not disregard the return channel of the DTT as a platform to distribute their services (as they are currently doing through the Web). This because elderly people, which are not comfortable with personal computers and the Internet, are instead used to the TV and its remote control, so it should be straightforward bringing all the important informative and interactive services over a suite of Xlets. A main problem with this project is that of ensuring the usability of such Xlets.

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However, in our opinion, developing an Xlet to browse the Web over the return line of the DTT is quite a nonsense, since it is almost impossible to navigate the Internet through a very limited input device as the remote control (instead of the powerful couple keyboard/mouse) and with a low resolution monitor as the TV screen, but recently other researchers tried to develop a browser for the DTT (Amerini, 2010).

Furthermore, we do not believe much in monitoring health parameters of sick people through DTT, since television is an entertainment medium and it is commonly associated with fun, leisure and news, not with illness and pain, and remote controls (that must not be abandoned to fulfill the needs of the elderly) are input peripherals too much limited for complex and tricky operations.

Instead we believe that the DTT will provide a bunch of purely informative or transactional interactive services for healthy people, but also for patients released from hospitals and for the elderly in nursing homes. These services range from simple TeleTexts, with information about pharmacies and general practitioners, to advanced transactions, as medical booking and simple payments.

It has been already argued that the promise of interactive services over the Digital TV for all members of the society may remain unfulfilled, unless the usability of the new medium is adapted to the diverse characteristics of the population (Chorianopoulos, 2006) and there is a need to adapt the traditional user interfaces design and evaluation methods to the home environment (Monk 2000). It will be mandatory to assure confidentiality and authentication within sensible transactional services, and it will then be useful to permit payments over this new medium (Papa, 2010).

Being aware of all these concerns, we developed an architecture for exploiting the potential of the DTT for Healthcare Services, both for sick and healthy citizens. The idea of rendering the digital interactive television an health information

platform for the future is not novel (see Gunter, 2003 and the project PANACEIA-iTV described in Maglaveras, 2003) but we provided a real scenario for many health-related services.

GENERAL ARCHITECTURE

This service platform has been originally designed to guarantee patient's monitoring and interactions with involved physicians and service operators (inspired by Maternaghan 2010)

The overall architecture consists of four main components (also see Figure 1):

1. **Patient's Control Centre:** This is the User's station at home or in a nursing home; eventually the User could be a patient that will be able to practise exercises or learn more about pathology and have a continuous monitoring sending data through an advanced patient station that transmits information collected by biomedical devices through wireless channels.
2. **Remote Clinical Centre:** This is the clinical actor of the service; during the day, or during the exercises practise, physicians at the clinical control centre can monitor patient's health status being automatically alerted in case of parameters exceeding thresholds.
3. **Broadcasting Centre:** A Local TV channel will broadcast typical programs (for example exercises like cycling, postural for cardiovascular diseases) every morning at an established hour, and the Xlet which will detect patient's vital parameters and send back them to the remote clinical centre.
4. **Service Centre:** It manages the return channel of the patients' station; it also develops, stores and send the Xlets to the broadcaster.

At home, some technological devices will eventually support continuous patient's monitor-

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