Chapter 6
How does Telemedicine Benefit from Broadband Technologies?

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ABSTRACT

The present chapter focuses on some aspects of the state of the art of telemedicine systems and their use over broadband. It starts with a brief summary of the most popular telecommunication technologies to give the reader an overview of today's broadband technology and methods. Some important deployment data are included showing the global growth and use in many countries. Results of very significant **pilot projects** *using videocommunication implemented in Italy and in Europe are taken into consideration, demonstrating the benefits of the patient's psychological status in conjunction with health care assistance. The chapter proposition is to show a business model, based on an Italian reality exploiting the Marche region population development and healthcare statistics. The simulation example is the adaptation of telemedicine solution for* **early hospital discharge** *applied to a public healthcare structure, typically a hospital. The model takes into account the possible adaptation of an "early discharge solution" implemented with portable telemonitoring light videocommunication terminals, which, thanks to broadband availability, may be installed at the patient's home for a predefined period (typically 7 to 10 days). The simulation aims to highlight and dimension cost reduction or, in a more appropriate view, give the percentage of resource that can be relocated to provide a better service and how a national healthcare service may take advantage of these scenarios.*

INTRODUCTION

Telemedicine has been a matter of research and convulsive generation of pilot networks and trials in all the world, all aiming to find the most appropriate solution and draw the economic model that could be of reference to define directives and guidelines which may help to provide remote medical cares.

The aim of this paper is to focus on some of the most significant results, carried out by researchers

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and healthcare organisations, in Italy and Europe and attempt to draw a suitable model, which taking advantage of the wide broadband deployment and cost effective approach, can be of help to identify solutions addressing sustainable telemedicine service networks.

The study gives the reader some highlights on the enormous growth and development that have characterized the telecommunication industry in this last decade (1990-2000), which has seen the domination of Internet, the IP protocols along with the new and much more economic broad band approach, allowing end users to access advanced network services in a much easer, faster and economic way, than some years ago these events open new frontiers of interactive applications, related to data transmission, video and IP voice, originating new services, which one can find useful and comfortable for itself, but in a more general contest are essential tools to improve social benefits and communities quality of life Gulla (2006), Tao (2005), (2004) Kevin (2003).

The study hereby exploited, wants to make the point on how these consolidated technologies, properly assembled and merged with more medical needs, have been successfully employed in pilot networks and trials, in many countries and have proven to be a suitable aid to provide better cares to elderly and weak persons, as well as a compelling support to healthcare and telemedicine applications and services.

But technology suitability and availability in not the only issue to permit that a feasible solution may be replicable and widely deployed in sustainable manner. Successfulness is still cost related and a more critical factor is the identification on the most appropriate telemedicine business model. As a matter of fact telemedicine applications addressed a few years ago would have cost impact higher than 30-40% or even more compared to today's solutions and broadband cost benefits (Pelissero and Velo, 2004), Gulla (2005), Gulla (2006).

This paper shares the authors experience in this field as an aid to those who seriously intend to design, implement and run local telemedicine networks, given that the final objective is to improve the quality of health care assistance and benefit from innovative technology cost saving methods and lesson learned experiences. Bearing in mind that any model cannot be successfully replicable if not designed in accordance with the local available resources, service requirements and constrains and local health policies.

METHODOLOGY

The study starts with a brief introduction to the most popular telecommunication technologies, gives an overview of today's broadband technology and **last mile** methods implemented by most of the telecommunication carriers, to reach end users with a suitable and useful bandwidth Gulla (2007). Broadband deployments data are included to give a measurement of how fast this technology is being used in all the world, providing the most recent available deployment data, thus proven the availability of broadband technology in many countries.

Results of very significant **pilot projects** carried out by carriers, service providers, universities and research centres in Italy and in Europe making use of **videocommunication** and vital parameters data gathering medical devices are taken into consideration, for showing that this technology not only allows the doctor to have a more complete view of the patient in understanding the patients psychological status to give more appropriate guidance and make more accurate analysis, but also to assure the patient that he is being visited by someone providing the necessary moral support Cleland (2006), Parati (2006), Klapan (2005).

The paper will then illustrate a business model, based on an Italian reality exploiting the Marche region population development and health care sta-