Chapter 8.1
Evolution in Broadband Technology and Future of Wireless Broadband

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ABSTRACT

In the last two decades, the availability of worldwide high speed Internet networks together with progressive deployment and adoption of broadband connections to Internet has significantly enhanced the ability to transmit video, audio and voice through the same channel with high performance. In addition to that, since the beginning of this millennium, there has been a rapid growth in diffusion of wireless broadband. In this respect, mobile broadband is gaining popularity lately in both developing as well as developed countries. The main reason for this growth in wireless broadband lies in its ability to serve remote areas at relatively lower cost than landline and its potential to transmit information seamlessly from anywhere in the world. The purpose of this chapter is to examine this changing diffusion behavior of fixed versus mobile broadband technology and highlight the future possible path of adoption for these technologies by users around the world.

INTRODUCTION

Explosive innovation in information technology and rapid expansion of mobile communications are changing the way we access and transmit information, bringing significant efficiency gain in our socio-economic activities. In the last two decades, availability of worldwide high speed

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voice through the same channel with high performance. However, in the early part of last decade, BB connection was limited only to fixed access technology. Since then, the rapid growth of mobile devices for both business and personal use has significantly enhanced the demand for wireless multimedia services such as data, voice and video. This has driven the need for development of new wireless standard and deployment of various types of wireless BB connections. Thus, in the new era, with the increasing speed and stability of mobile broadband connections, another revolutionary change is coming in the communications process which will facilitate access to and transmit of information from anywhere in the world by using a variety of exciting new mobile devices[2].

In last two decades, the use of wireless voice telephone communications has significantly increased in developed as well as in developing countries. Also, in recent years, with the increased capacity and speeds of wireless transmission and introduction of many new mobile devices with data access capability, people are increasing their use of this technology for their data communication needs. This change in behavior has created the demand for wireless access connections with higher bandwidth. Moreover, due to its cost advantage of deployment, this technology is not only becoming the communications platform for provisioning broadband access to homes in the urban areas but also a viable solution for providing services for homes in both remote and underserved areas. The purpose of this chapter is to study this evolving change in broadband technology and the role the wireless broadband access technology plays in this evolution[3]. More specifically, the object is to study the current trends in wireless broadband landscape and assess where the technology is heading as a whole.

Finally the aim of this chapter is to analyze the observed trend in the application of various broadband technologies by using historical data from the US and the rest of the world. For the BB adoption data, we use functional data analysis (Ramsay and Silverman, 1997) to estimate the velocity and acceleration associated with BB penetration in various countries around the world. In addition to that, this study formulates a simple time series model to provide a directional forecast for the future trend in the deployment and adoption of fixed as well as mobile broadband technology.

The layout of the chapter is as follows. The second section introduces the characteristics of various broadband access technologies and describes the benefits associated with their adoption. A brief description of the data is given in section III. In the subsequent section (IV), country specific differences in diffusion of fixed as well as mobile broadband technology are analyzed while taking into account the underlying dynamics in rate of growth of adoption. In section V, we study the trend in growth of fixed and mobile broadband subscribers and compare that with observed subscription behavior in landline versus wireless voice telephone service. Based on historical data for broadband adoption, we develop a simple model to predict the future trend in broadband adoption behavior for selected countries and the results are presented in section VI. The summary and conclusions are provided in the final section..

BROADBAND ACCESS AND ITS BENEFITS

Definition and Characteristics of Broadband Access

In operational terms, BB refers to a set of electronic communications technology solutions. The primary features that distinguishes this technology from other competitive transmission technologies include its relatively high bandwidth, always on functionality [4] and capability for high speed information transmission in both directions: downstream from Internet to the user's computer and upstream from user's computer to the Internet. An integrated view of these features, however, does