

Chapter XXXV

Digital Cable TV Networks: Converging Technologies, Value-Added Services and Business Strategies

Ran Wei

University of South Carolina, USA

Zizhong Zhao

Communication University of China, China

ABSTRACT

This chapter focuses on digital cable TV networks as a convergent network with telecommunications networks and the Internet that provides broadcasting TV and radio, telecommunications services, and IP-based publishing and e-commerce. The chapter first traces the technological evolution of cable TV, highlighting recent developments in digitalization and convergence. The transformation of cable TV networks from channel operators to unified platforms is discussed. In doing so, the key terms and concepts in cable TV technology are introduced. The technological, political, regulatory, and economic forces behind the convergence are also identified. Furthermore, this chapter examines the value chain and collaborative opportunities among the participants in the digital cable TV revolution. User-centered business models of managing digital cable TV networks are proposed.

INTRODUCTION

This chapter provides an overview of the on-going transformation of cable TV networks. As a result of technological advances, cable TV networks are transforming themselves from analog broadcast networks into digital cable networks of broadcast, telecommunications, and broadband Internet, so-

called “triple-play services” networks. The next-generation of digital cable TV networks will be a unified platform for delivering hundreds of TV channels, numerous add-on services, telephony services, and the Internet over fiber optic cables. The chapter focuses on tracing the historical evolution of cable TV networks, analyzing the role of new technologies in their transformation, and

discussing opportunities and challenges in overhauling the existing cable TV infrastructure.

The key concepts are cable TV networks, digital conversion, video compression technologies, digital cable TV broadcast, media convergence, and two-way cable networks as a multiplatform. They provide the necessary theoretical ground for a thorough understanding of the digitization process and the convergence of broadcast, cable, telephone, and the World Wide Web. Moreover, the chapter will offer new models in managing digital cable TV, which are in a position to offer a wide range of new services, content, and applications. The chapter ends with a brief presentation of challenging issues and management tools.

THE EVOLUTION OF CABLE TV NETWORKS

This section traces the origin of cable TV networks, including the concept of CATV, cable network infrastructure, basic cable technologies, and the major transformations of cable TV networks. Recent developments in upgrading cable TV networks are highlighted; they include the deployment of fiber optics and digitization. The on-going technological upgrades empowered cable TV networks to enhance interactivity and paved the way for them to provide a huge number of channels and add-on services.

The Infrastructure of Cable TV Networks

Cable TV networks refer to a system of transmitting and distributing broadcast signals to TV households using a network of fixed cables (Harte, 2007). Cable TV networks have a humble origin. They began as nothing more than a simple community-based distribution system for receiving clearer broadcast TV signals in remote mountainous areas in 1949. The system included large community antennas and coaxial cables, which

distributed the signal received from the antennas to individual households. It was thus known as “Community Antenna Television” or “CATV” (Guillory, 2006, p. 71).

Since the 1950s, cable technology was used in other areas in the U.S. It was during this period, CATV expanded into cable TV networks, which offered more over-the-air TV channels by importing distant signals. This expansion was characterized as the first incarnation of cable TV (Bates & Chambers, 2004). The year of 1964 was a milestone in the development of cable TV networks because American TV households subscribing to cable TV reached one million. After reaching this milestone, the growth in subscribers was gradual but substantial, totaling 41.2 million in 1987 (NCTA, 2007). In 1990, cable TV had reached more than half of the American households with a penetration rate of 50.5%. The rapid growth of cable TV networks during the 1970s and 1980s was largely due to the fact that subscribers were able to view more channels and had an enriched viewing experience. The launching of cable-only channels such as Home Box Office (HBO), EPSN, and Cable News Network (CNN) as well as the availability of super-stations such as WTBS and WGN on cable systems, contributed to the growth of cable TV networks.

As more and more TV channels were launched on cable TV networks, the channel-carrying capacity of cable systems in the United States increased significantly. Early systems carried a total of 33 channels, which tripled to 90-plus channels. They became a viable competitor with over-the-air TV networks. Multichannel cable networks were described as “television of abundance” (Bates & Chambers, 2004, p. 178). This transition was described as the second incarnation of cable TV (Bates & Chambers, 2004, p. 173). Cable TV networks completed the evolution from CATV to broadcast media.

Technically, traditional cable TV networks are analog systems. They include five components: (1) a headend (the facility used by cable service

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