

Digital Television and Breakthrough Innovation

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INTRODUCTION

As new technologies continue to emerge, firms in diverse industries increasingly must respond. Future economic rents and competitive advantage rests on the organizational ability to assimilate new technologies in the right manner. Broadcasters, content and service providers, packaging providers, and many other firms have been affected by the advent of digital technologies in the digital television (DTV) industry. All these firms have considered the adoption of digital technologies.

Digital television is a new television service representing the most significant development in television technology since the advent of color television in the 1950s (Kruger, 2005). DTV can provide several benefits: sharper pictures, a wider screen, CD-quality sound, better color rendition, integration with Web technologies, increased programming options, easy integration between broadcasting networks and broadband telecommunication networks (e.g., B-ISDN—Integrated Services Digital Network), and other new services currently being developed.

The nationwide deployment of digital television is a complex and multifaceted enterprise though. It has a profound impact on the entire TV system: from the offer typologies to the consumption manners. Therefore, a successful deployment requires the development by content providers of compelling digital programming; the delivery of digital signals to consumers by broadcast television stations, as well as cable and satellite television systems; and the widespread purchase and adoption by consumers of digital television equipment (Kruger, 2005).

In sum, the advent of the digital television has caused an actual breakthrough innovation on almost all levels of the value chain. Although the adoption of breakthrough innovations is highly risky to pursue, research has shown that firms always follow them (Charitou & Markides, 2003; Ketchen, Snow, & Hoover, 2004). In the case of the television industry, the adoption also happens

because the government and the telecommunication regulatory agencies in many countries have foreseen deadlines for the complete transition from analog to digital technologies in this industry. Despite lingering standardization issues, digital transmission is replacing analog transmission in the three major delivery platforms (terrestrial, cable, and direct broadcast satellite [DBS]) (Galperin & Bar, 2002). Therefore, in the future we expect that all firms in this industry will have adopted these digital technologies. Furthermore, this adoption will vary according to both the firm's activities and the type of breakthrough innovation.

This research will present some theoretical arguments to describe the adoption of the digital technology by two different activities in the digital TV industry: TV channels and content providers. These two different types of firms were chosen because the emergence of the digital TV has meant the adoption of different types of breakthrough innovation for each one of them. The next section defines these different types of breakthrough innovation. The two following sections describe the two cases of the adoption of DTV: by TV channel and by content provider. Finally, the last section presents the conclusion and implications of this research.

BREAKTHROUGH INNOVATION

This is certainly not the first time that the television industry faces a big innovation. There was the change from black-and-white to color TV signals, and the addition of the cable and satellite TV systems. However, the transition to digital TV is different. It implies a complete re-tooling of the existing video production and distribution infrastructure, from studio cameras to transmission towers (Galperin, 2005). Transition from analog to digital has not only technological effects, but also effects on the economical and cultural level for the television world (Pagani, 2003). Therefore, it represents a broad and distinct type of innovation.

Table 1. Differences between tech-based and market-based innovations

Dimensions	tech-based innovations	market-based innovations
Technology	Represent the state-of-the-art technological advances (Benner & Tushman, 2003; Chandy & Tellis, 1998).	Correspond to new ideas about business operations (Benner & Tushman, 2003; Christensen, 1997).
Market	Address the needs of existing markets and provide greater customer benefits than do existing products (Chandy & Tellis, 1998).	Offer new benefits that the new segments value. Their performance along traditional dimensions often may be worse than that of existing products (Christensen, 1997).
	radical innovations	disruptive innovations

This section focuses on the definition of breakthrough innovation. However, in order to understand this concept, it is important to have the general definition of innovation in mind. Research in innovation is confounded because of the equivocal definitions and measurements of innovation (Wind & Mahajan, 1997). Im and Workman (2004) identified that prior research has focused on the broad construct of innovation (often using the amount of innovations or patents). However, some scholars have been more specific in recent publications. This research has referred to minor changes in technology, and simple product improvements that minimally improve the existing performance as incremental, sustaining, and continuous innovations. On the other hand, innovations that are unique, or state-of-the-art technological advances in a product category that significantly alter the consumption patterns of a market (Wind & Mahajan, 1997) have been called radical, disruptive, and discontinuous innovations.

Based on recent research (e.g., Pagani, 2003 and Galperin, 2005), we observe that the transition from analog to digital in the television industry mainly presents radical changes related to the state-of-the-art technological aspects. This transition also represents disruptive innovation related to crucial changes on the consumption pattern of the television market. These types of innovation that generate either a radical or a disruption change are known as breakthrough innovation.

Recent studies (e.g., Zhou, Yim, & Tse, 2005) have created some categories to differentiate two types of breakthrough innovation. The first type is called “technology-based innovations” (hereinafter, tech-based innovations). Tech-based innovation represents firms that adopt new and advanced technologies. This type of innovation improves customer benefits relative to

existing products for customers in existing markets. The second type, market-based innovations, refers to firms that depart from serving existing, mainstream markets to new ones. The definition of market-based innovations refers to new and different technologies that create a set of fringe, and usually new, customer values (Benner & Tushman, 2003; Christensen & Bower, 1996).

Zhou, Yim, and Tse (2005) have differentiated both tech- and market-based innovations in both technology and market dimensions (Table 1).

Furthermore, in order to adopt either a tech-based innovation or a market-based innovation, firms should know how to respond to these innovations. The capacity to innovate is among the most important factors that impact business performance (e.g., Burns & Stalker, 1961; Porter, 1990; Schumpeter, 1934). It is through innovativeness that industrial managers devise solutions to business problems and challenges, which provide the basis for the survival and success of the firm into the future (Hult, Hurley, & Knight, 2004). In order to correctly respond to that, the first thing firms should do is to identify what a specific innovation represents to them. This research covers the main technological and market aspects to do this identification.

The following sections identify the type of breakthrough innovation that the adoption of digital television represents to TV channels and content providers.

MARKET-BASED INNOVATION AND TV CHANNELS/NETWORKS

TV channels and networks are those firms that assemble the contents supplied by both content producers and advertisers to be distributed by MSO, satellite, cable,

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