

LOOKING AT THE FACTS: WHAT WE KNOW (AND DON'T KNOW) ABOUT THE CHINESE INTERNET PROTOCOL TV MARKET

Abstract

Chinese consumers seem to embrace IPTV enthusiastically. The IPTV market in China is thus sizeable and clearly gaining speed. Like many economic sectors in the Chinese economy, the Chinese IPTV industry, however, has a number of idiosyncratic features. This paper examines the facilitators and barriers of the Chinese IPTV industry. We analyze how characteristics of Chinese consumers, IPTV suppliers, businesses in IPTV's value chain and those related to substitute technologies and China's tricky political landscape have superimposed in a complex interaction to shape the Chinese IPTV landscape. The insights developed in this article are important for understanding the rapidly developing trajectory of the Chinese IPTV industry as well as other high technology industries.

Introduction

China has arguably grabbed the global spotlight in Internet Protocol TV (IPTV) (Wilson, 2007). Although estimates vary across sources¹, different surveys concur that the Chinese IPTV market is sizeable and is clearly gaining speed. As of November 2006, China Telecom had trial IPTV networks in 23 cities (SinoCast, 2006d) and China Netcom (CNC) had such networks in 21 cities (SinoCast November 23, 2006). By the end of 2006, 60% of China's major cities were IPTV-ready (Chan, 2006). Similarly, China's IPTV subscribers increased 240,000 in 2005 (In-Stat 2006) to 5 million in the early 2007 (PRWeb, 2007), which is forecast to reach 10 million in 2008 (PRWeb 2007) and 23 million by 2012 (Heiser, 2007). Other studies suggest that China will be the world's largest IPTV market by 2010 (Ashling, 2005) and will account for a quarter of the global IPTV spending of \$1 billion in 2009 (America's Network, 2006; Table 1).

Being a combination of an empire and a modern nation, today's China is 'unusual' (Terrill, 2005). Most obviously, the Chinese IPTV industry, as is the case of other economic sectors, has a number of idiosyncratic features. In spite of the fast growth, the Chinese IPTV landscape still has plenty of wind in its sails. The effects of factors such as the state's entrenchment in the economy; regulation on culture and communications and restriction on foreign content; a deep thirst for domestic IPTV standard and availability of pirated and illegally re-broadcasted cable or IPTV signals are visible in China's IPTV industry.

In this paper, we investigate factors facilitating and hindering the growth of the Chinese IPTV industry. In the remainder of the paper, we draw upon the literature to examine factors driving the development of a technology industry. Then, we investigate factors driving the development of the Chinese IPTV industry. The final section provides discussion and implications.

Development of a technology industry: A theoretical framework

Numerous factors influence the development of a technology industry (Beise, 2001; Lehrer, et al., 2002). First, nature of *domestic demands and inputs* (Linder, 1961; Vernon, 1966) such as consumer preferences, income, availability and costs of input, infrastructures and government regulations and technological economies of scope (a function of prior national experience with previous generations of technology) influence the diffusion of a technology. Second, the importance of *industry structure* on the performance of a technology industry has been emphasized in the prior literature (Porter, 1990). Of special interest to this paper is the

¹ One source of variation is the criteria used to define what IPTV is.

development of related and supporting industries (Porter, 1990). For IPTV, for instance, related and supporting industries include those related to broadband, PC, cable, telecom equipment, etc. *Industry structure* can be explained in terms of the industrial organization theory. According to this theory, industry structure determines a firm's behavior, strategy and performance (Bain, 1956; Porter, 1990). Competition level, size and distribution of IPTV suppliers as well as nature and structure of related industries fall under this category. Finally, Transfer and export conditions such as trade policy, export orientation of the firms in the country, strategic regulation, and market size (Beise, 2001; Tilton, 1971).

We argue that the above factors related to the development of an industry in an economy can be captured in terms of the characteristics of consumers, the government, IPTV suppliers, businesses in the IPTV value chain and suppliers of substitute technologies. Our main focus is thus on these factors from the standpoint of the Chinese IPTV industry.

Factors driving the development of the Chinese IPTV industry

As a visual aid, Figure 1 schematically represents factors influencing the development of the Chinese IPTV industry. We discuss the building blocks of the framework in this section.

Consumer characteristics

Chinese consumers' propensity to adopt technology products

Prior research has indicated that Chinese consumers have a higher propensity to adopt new technologies than their income level explains. For instance, in the mid-1980s, the penetration rates of consumer durables in China were about the same as South Korea, Japan and then USSR (Sklair, 1994). In terms of the technology achievement index constructed by the UNDP (2001), China's rank 45 (out of 72 economies considered) put it in the group of "dynamic adopters" of new technologies and ahead of other developing countries with higher per capita GDP such as Bolivia, Colombia, Peru, Paraguay, Jamaica and Tunisia. The most relevant issue concerns the adoption of technology directly related with IPTV. One of the most straightforward explanations for the rapid IPTV diffusion in China is the country's broadband leadership. Paradoxical as it sounds, by the early 2006, a Chinese Internet user was more likely to be on broadband connections than his/her U.S. counterpart (Koprowski, 2006). According to U.K. research firm Ovum, China's broadband household will increase to 79 million by the end of 2007 (Frater, 2006). Ownership of personal computers, however, is much lower in China. This means that IPTV can represent a means of access to Internet-based information and social networking services (Wilson, 2007d).

Chinese consumers' perception of IPTV

There are reasons to believe that because of unique economic, cultural and political factors, Chinese consumers' value perception of IPTV may differ from those in other countries. Surveys have, for instance, shown that the Internet component of IPTV rather than the video entertainment is likely to be more popular in China (Wilson, 2007d). One such area is online gaming. In 2004, China had 20.3 million online game players, which generated US\$298 million (Weitao, 2005). The number of online game players is estimated to reach 57 million by 2009 generating US\$1.3 billion (Weitao, 2005). For this reason, Shanda Entertainment Interactive, China's largest online gaming operator, has made IPTV its top priority (Weitao, 2005).

Government agencies' adoption

Note that household consumers are not the only IPTV consumers. Indeed, in most developing countries, the government is the single biggest user of ICTs (Nidumolu et al., 1996). Government agencies in China are also among early adopters of ICT applications. Note that China

outperforms industrialized countries such as Switzerland, U.K., Singapore and Germany in e-governance (West, 2002). As is the case of other ICT sectors, advanced e-government programs of federal and local government agencies are likely to contribute to the growth of IPTV demand. CNC, for instance, is providing distance education to communist party members in rural areas in Henan (SinoCast November 23, 2006).

Demands associated with major events

Additionally, from the standpoint of IPTV demands, part of China's fascinating character stems from the fact that the country occupies an important global position. China is hosting crucial global events. Many industry observers expect that 2007 and 2008 as growth years for IPTV. Major events such as Beijing Olympic Games (Chan, 2006) and the 2010 World Expo in Shanghai (Heiser, 2007) will contribute to the further growth of the IPTV network.

Government's characteristics

Degree of clarity of vision and policies to promote IPTV

While the Chinese government is showing willingness to transform provincial TV stations from "conduits for propaganda" into "cash-rich conglomerates" (Wehrfritz et al. 2005), confused policy has been a major roadblock to realizing the full potential of IPTV (Stephen, 2007). Indeed, most high technology sectors are plagued with a lack of clear policies and regulative uncertainty. It is important to note that pointing out problems faced by organizations because of a lack of specificity, a business group asked the Chinese government to issue clearer regulations (Kalathil, 2003).

China Telecom and China Netcom have both built trial IPTV networks in a number of cities, but are unable to sign up commercial users because of the lack of IPTV regulations (The Financial Times Limited June 6, 2007). China's IPTV draft standard is likely to be released in August 2007 (SinoCast, June 8, 2007).

There has reportedly been inter-ministerial fighting over whether IPTV should be promoted at all because of the country's heavy spending on cable (Frater, 2006). Moreover, as it is in most countries, broadcasting and telephony have separate regulatory bodies in China. TV broadcasting regulators want TV providers to retain their rights of providing IPTV services (Wang, 2006). Both broadcasting and telecoms operators want to enter into the IPTV market (Asia Pulse December 8, 2006). Most obviously, broadcasting authorities are concerned that IPTV could hurt cable TV operators (The Financial Times, June 6, 2007). In December 2005, the broadcasting authorities in Quanzhou (Fujian) ordered the closure of an IPTV service jointly run by China Telecom and Shanghai Media Group (SMG), despite the fact that SMG had a license to operate IPTV by the State Administration of Radio, Film and Television (The Financial Times Limited, 2007).

Regulation impacting firms' value creation and delivery

A common thread runs through all sectors of the Chinese economy—government's deep entrenchment. According to UBS, the state accounts for at least 70 percent of the Chinese economy compared to less than 7 percent in India (Pei, 2006). Companies delivering IPTV-- China telecom, China Netcom, and the IPTV licensees, led by the first national IPTV license holder, Shanghai Media Group (SMG)-- are all government-owned. State-owned firms tend to place a higher emphasis on political and social goals rather than on market share and profits.

There are reasons to believe that political pressure rather than business sense may be driving IPTV launch and product offerings (Yan, 2007). Both China Netcom and China Telecom are operating services with average revenues per user (ARPU) of \$4-10 a month (Wilson, 2007b, d). And the low monthly IPTV subscriber fee is split with content provider

Shanghai Media Group (Stephen, 2007). This raises the possibility that IPTV providers may not be motivated to provide high quality services.

Another uncomfortable reality is that while much of China runs as a free-market economy, culture and communications are among the most regulated sectors (Frater, 2006; Wilson, 2007a). Because of concerns about the ideological dangers (Chan et al., 2005), foreign content is highly restricted (Chan, 2006) and cannot be broadcast live (Wilson, 2007b). It's hard to imagine the availability of foreign contents in the near future.

Regulation impacting firms' technology choice

Another point to bear in mind is that Chinese have a deep thirst for domestically developed ICT standards. In the Chinese policy landscape, there has been a strongly expressed desire for the representation of Chineseness in ICTs. A high level of advocacy for national self-reliance and domestic development of technology exists among Chinese policy makers, researchers, scientists and military leaders (Simon 2001). Foreign technology imports and the outflow of royalties have been a focus of concerns among Chinese policy makers (Einhorn, 2004). Chinese have paid considerably large amount of royalties in past ICT standards such as those related to mobile telecom and DVD (SinoCast China IT Watch, March 19, 2007). For instance, China is the world's largest maker of DVD players. Estimates suggest that by adopting its own technology, the country can save \$2 billion a year in royalties being paid to an 18-company consortium (Calbreath, 2004). There is also the matter of national pride in having domestically developed technological standards and setting standards for the world. The upshot of these tendencies is that Chinese telecom companies face pressures to adopt domestic standards irrespective of their success potential.

China's past attempts to set standards for the world have been unsuccessful. Since the 1980s, China made several attempts to develop a Chinese computer operating system, but failed because of the rapid movement of the global software industry (Goad and Holland, 2000)². In the past, China has had more misses than hits on the standardization front. Chinese are working very hard to create Chinese standards in computer operating systems, audio-video compression and third generation (3G) data standards (ZDNet Asia, 2003). More recently, the Ministry of Information Industry (MII) is organizing domestic R&D institutions, telecom operators and manufacturers to join in the IPTV standardization research activity (Asia Pulse, March 27, 2007).

Chinese do not want to repeat past "mistakes" in the emerging IPTV industry. Chinese think that patent charges on IPTV standards--MPEG-4 and H.264-- are huge. China's push to develop its own standard is motivated to avoid paying license fees to MPEG LA and the ITU for using the H.264 standard (Sin, 2007).

It is thus easy to imagine why Chinese want to have their own IPTV standard. China is determined to promote home grown encoding technology, AVB, and digital broadcast technology, DMB-T (Sin, 2007). The video aspect of the digital audio and video encoding and decoding technical standard (AVS), a homegrown standard for IPTV, won approval to become the national standard in March 2006 (SinoCast, June 8, 2007). Note that China owns full intellectual property rights (IPR) in AVS, which is considered as part of ITU's global IPTV standard (SinoCast, March 19, 2007). China plans to make AVS-supported IPTV network available to 4 million users by 2009 (Asia Pulse, March 27, 2007; SinoCast, March 19, 2007).

²China's attempt in the mid-1990s to introduce its CD standard, Super Video CD to the world also faced foreign market resistance as well as a lack of strong consumer support within the country.

The IPTV networks of China Netcom and China Telecom are mainly based on foreign standards. Both companies, however, have been building AVS- based pilot networks (SinoCast, March 19, 2007). China Netcom completed IPTV tests based on AVS in Dalian and reported an equivalent effect to H.264 (SinoCast, April 20, 2007). As of the mid-2007, China Netcom had built AVS-based IPTV network for 3,500 households in Dalian (SinoCast, June 8, 2007). The company plans to expand it to 20 cities by the end of 2007, and expects to have 6 million AVS-based IPTV users in 5-6 years (Yan, 2007).

Some observers, however, believe that compared to H.264, AVS is immature and may even entail higher costs (Yan, 2007). It is important to note that immature technologies may create risks for reliability and quality of IPTV network (David and Steinmueller, 1994, p. 230).

Tax, subsidies and other institutional interventions to promote IPTV

Governments' subsidy to technology-intensive industries (Newman et al., 2006) has played a key role in China's technological development. Government subsidies in various forms are also flowing through the IPTV operators (Wilson, 2007d). For one thing, government's "rural area informatization" policy is expected to promote geographic equity in IPTV (Business Wire, 2006b). The government also has a goal to have all households having access to digital technologies by 2015 (MediaNet Press Release Wire, 2007).

Intellectual property rights (IPR) regime

The growth of the high technology industry is tightly linked to the nature of IPR regime. It is also essential to recognize that because of a high rate of illegally re-broadcast cable or IPTV signals in P2P services (Xinhua Financial Network News, January 19, 2007) may jeopardize IPTV suppliers. Estimates suggest that China has 70-80 IPTV companies operating in a gray area (Frater, 2006). The country's software piracy rate exceeded 90% in 2004 (Evans, 2004). Although provincial and local laws have been amended and abolished to comply with the World Trade Organization (WTO), it is far from clear whether local authorities take substantive IPR enforcement measures (Yang, 2002). Indeed, attitudes of people involved in the enforcement have hampered IPR protection (Shen, 2005).

IPTV suppliers

IPTV providers' offerings, value creation, value communication and value delivery

The "soft" concepts of management, such as marketing and consumer behavior are not integrated into Chinese thinking (Borgonjon and Vanhonacker 1992). Chinese IPTV firms thus may face problems to market their offerings. IPTV in China has yet to form mature business models. Currently, telecom operators, radio and TV units and content providers have engaged in cooperative works but with unclear business models (PR Newswire, 2007).

Yet, having said this, it is apparent, too, that Chinese IPTV providers have come up with some creative offerings. In Shanghai, for instance, customers get a free set-top with a two-year contract. In Harbin too, China Netcom has waived set-top box fees (Wilson, 2007b, c). SMG is also offering a service to consumers who want to upload their own video content (Wilson, 2007d). Similarly, Shanghai Telecom's service allows to book medical appointments over IPTV (Morris, 2006). BesTV, Shanghai Broadcasting Cooperation's digital media arm, is working with local banks to develop a bill-paying service. The company is also prototyping a service that lets investors to track their stock portfolios. In addition, BesTV is working on a service that would allow consumers to get health care advice and to make doctors' appointments (Wilson, 2007d).

Businesses in IPTV's value chain

Technology manufacturers: Companies such as ZTE, UTStarcom, Huawei and Alcatel Shanghai Bell (ASB) have been developing IPTV technology (SinoCast December 12, 2006).

These companies have delivered IPTV technology based on low-cost set-top boxes, which is viable at a low average revenue per user (ARPU) (Wilson, 2007). Most impressive of all, domestic manufacturers have been key suppliers of IPTV technologies. Shanghai Telecom uses ZTE's IPTV technology (Morris, 2006). ZTE has won contracts from operators to supply IPTV equipment and solutions in a number of cities and provinces including Beijing, Yunnan and Shaanxi (SinoCast December 12, 2006). China Telecom has also partnered with the local TV maker Sichuan Changhong to produce Internet-ready TV sets (Weitao, 2005).

Content suppliers: A lack of content, however, has been one of the biggest problem facing IPTV services (Wilson, 2007d; PR Newswire US, 2007). There is a lack of local content (Chan, 2006). As indicated earlier, the government maintains tight controls over foreign content (Wilson, 2007a).

Suppliers of substitute technologies

P2P services: From suppliers' perspective, there is another fear for the development of Chinese IPTV industry-- re-broadcasting of IPTV signals in China's peer to peer (P2P) services. P2P video streaming has been successful in the country. One estimate suggests that about half of Internet traffic is P2P streaming (Stephen, 2007). According to the research firm, IDC, P2P services in China illegally re-broadcast cable or IPTV signals and are thus evading the original broadcasters' fees (Xinhua Financial Network News, January 19, 2007). As of the early 2007, there were over 100 million users of P2P streaming and 5-10 million of them used IPTV services (Stephen, 2007). It is thus not clear whether users are willing to pay much in IPTV (Stephen, 2007).

Cables: There is no satellite service (Wilson, 2007e) but most commonly viewed channels are delivered by cable (Wang, 2006). As of the early 2007, there were 12 million digital cable services (Stephen, 2007). For instance, most commonly viewed channels (e.g., HBO) are already delivered by cable. It has been a problem for IPTV providers to differentiate IPTV from cable providers (Wang, 2006). Nonetheless, compared to cable providers, China's telecom operators, however, have major advantages-- they have more money and have deployed a newer infrastructure (Wilson, 2007e). Cable TV is provided by thousands of small operators and the cable industry is thus fragmented. Many are municipally owned (Wilson, 2007e). Moreover, cable services in China are much below the level that is taken for granted in industrialized countries (Wilson, 2007d).

Discussion and implications

The foregoing discussion provides a framework for understanding China's IPTV terrain. We analyzed how characteristics of Chinese consumers, IPTV suppliers, businesses in the IPTV value chain and government policy and regulations are shaping the Chinese IPTV landscape. The insights developed in this article have important implications for management practices and public policy.

Horizontal collaboration: Horizontal coordination among companies in IPTV's supply chain is needed to enhance the value delivery. Because of restrictions placed on foreign contents, there obviously is a need for more local contents. While some companies (e.g., UTStarcom) are working with the government and media authorities to generate more IPTV contents (Chan, 2006), local content providers need a bigger push.

Efforts directed towards communicating values: Experiences of some companies (e.g., Carrefour) (Child, 2006) indicate that for products that are new to China, considerable efforts need to be directed towards communicating values and educating Chinese consumers about

product benefits. What seems to be happening behind IPTV's relatively low acceptance rate (M2 Presswire, March 13, 2007) is Chinese consumers' lack of understanding of values and benefits. IPTV companies are thus required to team up in communicating IPTV's benefits to potential consumers.

Influencing government policy: As indicated above, confused policy has been a major roadblock to realizing the full potential of IPTV (Stephen, 2007). Firms at IPTV's value chain may team up to influence government policy on this technology. For one thing, IPTV investment strategies that contribute to the government's ICT goals such as "rural area informatization" and increasing household penetration of digital technologies are more likely to win the government's legitimacy.

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Table 1: IPTV in China: A Timeline

Time	IPTV milestone
May 2005	Shanghai Media Group (SMG) got first IPTV license and launched first IPTV service in Harbin (Liu, 2006).
December 2005	No. of IPTV subscribers: 240,000 (In-Stat 2006).
May 2006	CCTV gains second IPTV license.
October 2006	Four IPTV licenses issued (China Economic Net 2007).
December 2006	China Telecom's IPTV network in 23 cities and China Netcom's in 21 cities. 60% of major cities were IPTV-ready (Chan, 2006).
Early-2007	No. of IPTV subscribers: 5 million.
February 2007	Beijing TV Station obtained sixth IPTV license (China Economic Net, 2007).

Figure 1: A framework to understand the development of the Chinese IPTV industry

