

US Cable Industry between Content and Information Services¹

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1 Introduction to US Cable Industry

More than 95% of 106.5 million households in the US have a physical connection to a cable system (Kagan World Media 2002). Almost 70% of these households (72 million) subscribe to cable (analogue and digital). By 2002, the US cable industry (with 308 national cable networks) had consolidated to the point that five main cable operators (distributors) - so called 'multiple system operators' (MSOs) - dominated the market, serving more than 70% (about 50 million) of the 72 million subscribers (see Table 1). One of the latest concentration activities was in November 2002, when Comcast - at that time number '3' in the market - acquired AT&T Broadband, then number '1'.

The main cable programmers (channels / aggregators), including HBO, Showtime, ESPN, Discovery, Madison Square Garden Network and Comcast SportsNet serve all of the large cable operators (see also Loebbecke, McInnes 2003).

Most cable operators, including the 'Top Five' mentioned above, use a so-called 'Hybrid Fiber / Coax' (HFC) architecture for which a rather massive roll-out began in 1998-1999; by the end of 2001 about 75% were completed. They apply fiber optic transmission technology to replace upstream coaxial trunk and feeder lines while, downstream, the incumbent / existing coaxial feeder and drop lines remain intact. Thus, by replacing coax with fiber optic lines

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upstream, MSOs achieved improved signal reliability and picture quality. The HFC architecture also permits MSOs to install modules that activate a reverse path, allowing customers to send data or voice signals from their home to the head-end. Such a reverse path, for example, allows users to push the 'Buy' button in the context of pay-per-view applications. Furthermore, this new architecture offers a significant increase in channel capacity and thus offers high-speed Internet access (through cable modems) or cable delivered telephone service.

Finally, back in 2000, cable operators began to replace analogue set-top converters with digital home communication terminals which employed compression technology to significantly increase channel capacity. Compared to analogue set top-boxes, the digital home communication terminals offer substantial improvement of sound and picture quality and broaden the usable transmitting capacities due to compression techniques (factor: 4 to 12). Regarding the necessary digital TV receiver, major consumer electronic companies and MSOs agreed, during the 4th quarter of 2002, on plug and play-standards in rather vague terms. The broad roll-out started in the first half of 2002 and by the end of that year more than 60% of the 'Top 100' cable markets were connected. These digital home communication terminals offer - in addition to Interactive Program Guides (IPGs) - other enhanced TV services such as the capacity and the functionality of Personal Video Recorders (PVRs) and Video of Demand (VOD).

The combination of fiber optics, amplifier upgrades, and compression technologies laid the foundation for cable operators to offer 'video-on-demand' (VOD) and a further variety of interactive multimedia services. By the end 2002, most major companies including Comcast Corp. (No. 1), Time Warner Cable, Charter Communications, Cox Communications, Adelphia Communications, Cablevision Systems (No. 6), and Insight Comm. (No. 9) had moved VOD beyond technical trials and offered it as a commercial product in selected markets.

Top Five Cable Operators in the US based on market share (number of subscribers)		
	Before November 2002	Since November 2002
1	AT&T Broadband 19% (13,440,000)	Comcast Corp. 30% (21,305,100)
2	Time Warner Cable 15% (10,862,000)	Time Warner Cable 15% (10,914,000)
3	Comcast Corp. 12% (8,481,500)	Charter Communications 9% (6,578,800)
4	Charter Communications 9% (6,697,900)	Cox Communications 9% (6,280,800)
5	Cox Communications 9% (6,263,400)	Adelphia Communications 8% (5,321,700)

Table 1: Top Five US Cable Operators (MSOs)
(Source: National Cable & Telecommunication Association 2003a, Credit Lyonnais Securities 2002)

2 Towards a Framework for Assessing the Competitive Situation of Major Cable Operators in the Markets for Content and Information Services

To synthesize the complex and interrelated factors, the authors propose a first schematic framework (see Figure 1) for analyzing the competitive landscape in the cable industry situating consumers at its center.

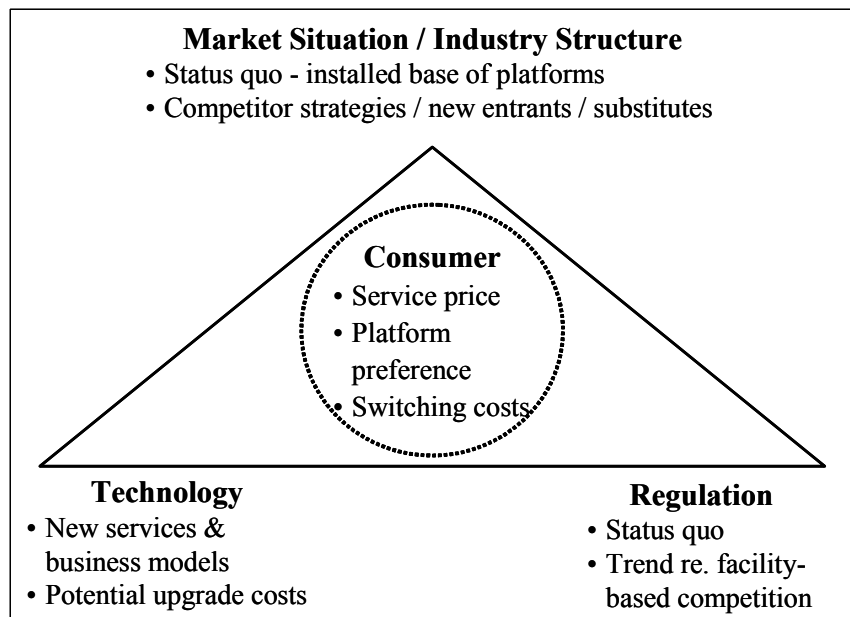


Figure 1: Factors affecting shift of focus from content to information services

The framework can be applied in order to investigate the situation of cable players vis-à-vis satellite service providers (focus on video content distribution) as well as vis-à-vis Digital Subscriber Line (DSL) providers. The latter are mainly incumbent local exchange carriers (ILECs) in the US or mainly telecom providers in Europe. Next, we will briefly compare the US cable operators with satellite providers on the one hand and ILECs on the other hand.

3 Competition in the Market for Video Content Services: Position of Incumbents

In spite of such technological improvements, MSOs increasingly face competition from satellite operators in the market to provide video content services. This is especially true for analogue cable services.

In 2002, almost 25% of all US subscribers obtained video content services from some company other than their local cable operator. Direct Broadcast Satellite (DBS) accounted for almost 20 million customers by the end of 2002 (see Table 2).

	Cable		Satellite
	Analogue	Digital	
2002	52,800,000	19,200,000	19,900,000
2001	56,100,000	15,200,000	17,900,000
2000	59,600,000	9,700,000	16,000,000

Table 2: Development of US Cable and Satellite subscribers
(Source: National Cable & Telecommunications Association 2003a,
Satellite Broadcasting and Communications Association 2003)

The few satellite players are big. DirecTV, the largest satellite player, has 11 million subscribers (as of end 2002). This is more than all but two cable operators count. The number '2' in the DBS market, EchoStar, has with 8,5 million subscribers (as of May 2003) more customers than all but three MSOs (Echostar 2002; and own calculations). Until mid-2003, the MSOs - when facing competition from satellite operators - have been willing to sacrifice market share rather than engage in a price war. Further on, when News Corporation buys DirecTV, it is expected to be placing PVRs in every satellite box which will thus force cable companies to respond with significant amounts of investment.

Competition for the cable industry also arose from facilities-based broadband² companies such as RCN³, Knology⁴ or WideOpenWest⁵, even if most over-builders have failed or are struggling. Finally, competition has emerged from telecom operators such as Qwest, which delivers video content in the metropolitan Phoenix area based on VDSL technology. Qwest has expanded their VDSL television in Phoenix, AZ, and offers 199 channels over DSL to some 300,000 potential homes in the region, though only 40,000 subscribers in Phoenix and Denver are actually signed up for the service. However, many telcos have reduced their ambitious VDSL plans due to the excessive cost of deploying the technology. Even Qwest has

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- 2 'Broadband' is used as the generic term for high-speed access to the Internet, referring to connections capable of at least 200 kbps both upstream and downstream. Since many residential customers subscribe to high-speed services which are slower than 200 kbps in the return path (where data demands by such users are usually lower), we do not differentiate between 'broadband' and 'high-speed' (one-way broadband) connections.
 - 3 RCN, a residentially focused competitive local exchange carrier is the first, and largest, competitive provider of bundled cable TV, phone and high-speed Internet services in the US. With its fiber optic Megaband Network, over which they deliver broadband services, RCN currently serves more than one million customer connections in the Boston, New York, Philadelphia, Chicago, Los Angeles, San Francisco and Washington, D.C. We are the only residentially focused competitive local exchange carrier in the industry.
 - 4 Knology, founded by ITC, a telecommunications holding company in West Point, GA, started from its beginning with fiber optic technology. The company's target markets are cities in the Southeast with a home count of 70,000-300,000 and a geographic density that averages a minimum of 75 homes per mile. Their self stated goal is to provide network access to 1.5 million homes and businesses by 2005. With a 34% increase in its consolidated revenue from of US\$ 106 million in 2001 to US\$ 142 million in 2002 and a 24% increase in the number of its connections from year-end 2001 to year-end 2002, the company could reduce its declared net loss to US\$ 2.6 million in 2002 (from US \$ 90.4 million in 2001).
 - 5 WideOpen West, founded in 1999, is the 12th largest cable television company and a leading Broadband Services Provider in the US (Illinois, Michigan, Ohio). It counted over 300,000 cable and HSD customers by year-end 2002.

admitted to a 'low probability' that they will expand the VDSL video service into other markets.

4 Competition in the Market for High Speed Internet Access: Position of the First Movers

Broadband competition goes beyond the provision of video content services. Being challenged by other players and other technologies in their traditional field of video content provision, cable operators have responded by offering information services⁶, especially high-speed Internet access and cable telephony service. Cable operators have been the first movers demonstrating their ability to invest for growth but their position remains influenced by the roll-out of DSL and the evolving legislative framework in the US.

Investment for Growth

Cable operators took early leadership in developing the market for high-speed Internet access, making it the fastest-growing sector for most cable companies. By December 2002, the cable industry had invested more than US\$70 billion in private capital to provide advanced digital services to consumers. An estimated US\$14.6 billion was invested in 2002 alone. These figures equate to more than \$1,000 per subscriber in upgraded cable systems. As a result, more than 85 million households were passed by activated two-way plant, allowing for the deployment of interactive, cable modem and telephone services (Kagan World Media 2002).

This investment has been challenging. Excite@Home, the previously leading broadband access provider and backbone for cable modems, invested over US\$9 billion in high-speed networks, and served 4.1 million subscribers when it dissolved in late 2001.

Nevertheless, by the end of 2002, digital cable modem customers topped 19.2 million. Also at year-end, US cable companies served more than 2.5 million residential subscribers for local cable telephone service (National Cable & Telecommunications Association 2003b).

DSL Roll-Out

Soon after, various competitive offerings from various telecom players began to emerge. Notably, the deployment of cable modem services triggered a nation wide roll-out of DSL offerings. The four major ILECs, BellSouth, Qwest, SBC Communications and Verizon, offer DSL and accounted for more than five million customers in the 3rd Quarter of 2002.

However, the combination of necessary investments in technology, market demand, and regulatory setting has not been always beneficial to DSL providers. Among the well-

6 In a Declaratory Ruling adopted on March 14, 2002, the FCC concluded that cable modem service is properly classified as an interstate information service and is therefore subject to FCC jurisdiction. ... cable modem service is not a 'cable service' as defined by the Communications Act; ... cable modem service does not contain a separate 'telecommunications service' offering and therefore is not subject to common carrier regulation (www.fcc.gov/Bureaus/Cable/News_Releases/2002/nrcb0201.html).

publicized bankruptcies are Northpoint Communications, Rhythms, and Covad, the three leading wholesaler providers of DSL networks in the United States.

The remaining players have prepared to gain back traditional information service market share: For instance, Verizon Communications announced in May 2003 that it was cutting rates for high-speed access to US\$34.95 a month from US\$49.95; most cable companies charge more than US\$40 a month.

Regulatory Environment

The regulatory environment also influenced the competitive situation. While cable companies have largely escaped 'open access' rules mandating that they share their high-speed Internet access networks with independent Internet Service Providers (ISPs), legacy voice systems were subject to sharing requirements. Local telephone companies had to offer total resale, or unbundled network elements, to competitors at regulated wholesale rates.

Particularly two decisions taken by the US Congress previous to the FCC's Triennial Review of 2003 have had an impact on the competitive situation. In 1992, the US Congress required that vertically integrated MSOs, such as AOL Time Warner, make their programming services available to competitors at fair terms. The 1996 Telecommunications Act kept this requirement but otherwise more or less deregulated the cable industry. It was said that cable regulation would expire in 1999. Most barriers for telecommunication and cable companies to enter each others markets were removed. Nevertheless, by 2002, most ILECs had reduced their original plans to enter into competition with cable companies by 'overbuilding' cable operators' networks with their own HFC infrastructures for three main reasons (for a similar argument see also Eisenmann, Lutz 2002):

- Compared to the cable operators' networks, ILECs face a cost disadvantage by having to build HFCs from scratch. ILECs mostly lacked coaxial cables for the last mile between their fiber nodes and customers' homes. Their existing twisted copper lines were designed to carry narrowband voice transmissions but were not sufficient for transmitting video signals.
- Increasing competition between ILECs and cable operators would lead to price cuts to end users paired with increasing programming and marketing costs.
- The 1996 Telecommunications Act has granted Regional Bell Operating Companies (RBOCs) permission to offer long distance services as soon as they fulfilled the requirement imposed on them to cooperate with competitive local exchange carriers wishing to leverage RBOCs' facilities⁷. In spite of declining long distance prices, decent

⁷ While in July 1997 the FCC denied Bell South's application to enter the long distance market, after its second attempt in July 2001, BellSouth received approvals for various states in May 2002.

gross margins still tempted ILECs to enter the long distance market before tackling the seemingly risky and obviously expensive video market.

However, in light of the FCC Triennial Review of February 2003 which eliminates the asymmetrical regulatory treatment of DSL and the cable modem platform (the former previously treated as a telecom service, the later not), ILECs may find new arguments to expand their content offerings. Specifically, ILECs offering DSL services will be freed of the sometimes cumbersome common carrier rules. Amongst other implications, the ILECs will be freed from making DSL available on an unbundled basis. This may provide a new impetus since it has been demonstrated that companies that bundle services like video, telephone and high-speed Internet access an advantage in retaining customers and generating the lowest churn rates. This may influence an ILEC's crucial decision whether or not to 'overbuild' cable operators' networks with their own HFC infrastructures.

5 Outlook

Satellite service subscription growth rates, market entrance of other multi-channel video providers as well as MSOs' own technological innovations (digital, high storage, intelligent set-top boxes) have put high pressure on MSOs' traditional (video content distribution) business lines.

At the same time, MSOs have successfully entered the market of high-speed Internet access. Cable operators' high speed cable modems account for almost 70% of all US customers. It seems that the combination of technology, the market situation arising from the timing of market entry and the regulatory environment lead the Internet access market to tip to the advantage of MSOs.

Customers are increasingly indifferent to who is offering them which application or service and which infrastructure the provider uses. This has led to significant shifts in the markets for traditional information as well as video content services.

The US cable industry and its competitors in the markets of video content distribution and high-speed Internet access have had to endure significant regulation including widespread uncertainty over what rules may be imposed or rescinded. MSOs, satellite providers, ILECs, RBOCs and other broadband providers may have curtailed investments in infrastructure and technology due to regulatory risk, even in cable operators spent about 70 billion. As a result, investments in content and applications have lagged, reducing consumer demand and further inhibiting investment in networks.

It has been hypothesized that the shifting focus from content to information services in the US cable industry is influenced by technological developments and the regulatory setting. The European situation is on some counts quite different; for example, broadband service delivery is still dominated by DSL providers as opposed to cable or satellite operators in most European countries. In this context, the authors propose to extend their research to examine the recent developments in the European cable market(s) in the context of broadband

convergence. For instance, in Germany, the four cable operators increasingly coordinate their activities in order to tackle competition from satellite, DSL providers as well as from Digital Video Broadcasting Television (DVB-T). They have begun to take advantage of set top boxes developed and tested in the US and thus, seem to have a good 're'-starting position after several years of low market shares. However, the representatives of alternative infrastructures also see their chances. It remains to be seen how a country like Germany will lean towards one dominating technology or promote several infrastructures hoping for a fruitful co-existence.

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