

CABLE INDUSTRY OUTLOOK

Bringing Enhanced Cable Services to Market: Forecasts and Analyses

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This has been a hectic and pressured year for the cable industry. The Telecommunications Act of 1996 has turned the cable and telephone sectors into combatants, as each jealously eyes the other's service base. Motivated by market studies that forecast 15% of each market migrating to the competitor, cable has more to gain from getting into the telephone business than vice versa. Making matters worse for cable is the stunning success of direct broadcast satellite (DBS), which reached three million subscribers in just slightly more than two years, making it the most rapidly received new consumer product in history. All those households putting up tiny dishes to get digital pictures and sound—not to mention 15- to 30-minute start times on pay-per-view movies—has taken a big chunk out of cable's premium subscription base.

If that isn't enough, the Internet tsunami washed viewers away from the television and carried them out to surf the 'Net. By late summer, a flood of statistics revealed good news and bad for cable. The good news was that overall viewing of cable networks was up slightly, although broadcast networks continued to lose share. The bad news was that the increases were

in the less favorable demographic categories. The most highly-desired viewers had either turned to the heavens for their programming and/or had shifted their viewing habits to include the Internet, where reruns and syndication do not dominate the program content.

Stay or Sell?

In the midst of all this, cash-starved cable operators were nudging their fees up to maintain the debt load, drawing flack from both consumers and politicians. The firestorm once again centered around TCI which raised its fees by the biggest percentage, thus impacting the largest number of subscribers. John Malone, the great white shark of the cable industry, disappeared from view for most of the summer. TCI spokespersons attributed his low profile to a slow recovery from a virus, speculated by many to be the "revenue flu." By fall, Big John had liquidated most of his personal holdings in TCI (reportedly down to 1%) and had shifted his equity over to Liberty Media, the content arm created to supply TCI with programming.

In parallel, the silent war between media monolith Time Warner and telco tyrant U S WEST continued in the shadow of the Time Warner acquisition of Turner Networks. Jerry Levin, Chairman of Time Warner, and Ted Turner, ever the Captain Outrageous, worked to soothe the ego of John Malone (TCI owned 22% of Turner), while placating the Justice Department's fears that the merger would upset the balance of power on the programming supply side. Meanwhile, Levin worked to pacify U S WEST Chairman Dick McCormick, who invested in Time Warner to obtain access to content and cable systems only to have Time Warner reorganize and push U S WEST's equity into a

new cable properties subsidiary. By late October, Levin was seriously considering selling off the Time Warner cable systems to U S WEST entirely.

How bad are things when the top two cable multiple system operators (MSOs), who control almost 40% of subscribers between them, are questioning whether or not they should be in the cable business or shift over to the content side? That kind of sums up the basic problem. Every cable operator in America is faced with a serious question: stay (and fight) or sell? In today's market, a cable subscriber is worth between \$1,800 and \$2,200 ISV (If Sold Value). To compete in the long term, the cable operator is facing an investment equal to the ISV in new plant technologies to upgrade the system infrastructure. This creates a \$4,400 per subscriber swing. Reinvesting to remain competitive more than doubles the mortgage and drives up the cash requirements to service the resulting debt load.

These were the key issues at the Kagan & Associates New Media Conference in New York City the last week of August. The theme of the conference was cable and Internet. The smoke had begun rising earlier in the summer at the CTAM (Cable Television Administration & Marketing) conference (detailed in the last issue of *NTQ*), and now the flames had become a raging inferno. Some cable operators were racing to roll out Internet access services, while others stood by watching the flames. Paul Kagan had, once again, assembled a cast that addressed a broad range of issues. Kagan's focus (which is why I'm a fan of his) was Where is the market? and What will generate new revenue? When the conference was over, some of the smoke had cleared, and several key themes had emerged to tell the cable industry what it needed to do to compete and prosper:

- (1) *Get off your butts and get going!* Wireless competition will hit in late 1997, while wireline (xDSL) services will be a year later. If you are not providing new services by then, you'll be steamrolled by the telco competition.
- (2) *Stop worrying about the money to pay for upgrades!* Three separate times, Wall Street representatives got up and pleaded for cable to come see them. "We have the cash, we've crunched the numbers, we know what the new services are worth, we *will* finance you!"
- (3) *Get a product out there—FAST!* As vendors argued on panel after panel about who had the best (or most elegant) solutions, the point was made time

and again that getting a product that will capture the consumer's interest—and loyalty—to market was the most important issue. This was highlighted by the Internet, which even at slow access speeds has captured the imagination of the American public. The point was driven home by Steve Pearlman, President of WebTV Networks, by demonstrating his product live, on television—in real time. Steve announced that Magnavox and Sony versions of the WebTV box were on their way to 20,000 retail outlets in time for Christmas. At a \$329 price point, this puts them into the same category as high-end game consoles and DBS receivers. The Internet is coming to TV, so you better get ready. The "elegance" argument was highlighted by the Wall Street people, who stated, unequivocally, that an "asymmetrical" solution of high-speed downstream over cable coupled with a lower-speed upstream over telephone lines was an acceptable entry-level product to grab market share. All the while, the cable modem manufacturers bickered about who had the best technical solution.

Enhanced Services

Based on research conducted earlier in the summer, few could disagree. Focus groups had shown that consumers would watch the Internet on their TV, equating its entertainment value to that available from broadcast or cable. Maybe it was summer reruns, but even households with multiple PCs (one in the den, one in the kid's room) would surf the 'Net from their couches. As other studies emerged, so did the same message.

In the same timeframe, a cable survey commissioned for large urban/suburban systems to identify what operators were doing to meet the challenge showed mixed results. System upgrades were in process:

- One in four system upgrades were already completed (at least to a fiber optic backbone level).
- Two in four were at some point in the process.
- The remaining one in four was waiting to see what happened next.

The subject of providing Internet access was included in the survey, yielding varied results. The respondents felt that Internet represented a major opportunity (80% said yes), but fewer (20%) were

moving forward. A multi-tiered model was used to measure what type of service was being planned:

- Full Service, including e-mail and hosting Web pages.
- Basic access with e-mail.
- Access alone.

Most of the respondents had not considered this model and, in fact, didn't realize what the components of Internet service provisioning entailed. At the corporate level, the larger MSOs were developing plans based on infrastructure upgrade, placing service second. Three of the top 10 (TCI, Cox, and Comcast) had already partnered in @HOME, and felt they had the service side covered. A fourth, Continental Cablevision, was in the process of developing a service, later announced as Network1 and provided by BBN Planet. And Time Warner was adding Internet to its FSN trial in Orlando by contracting with a local provider. Three years earlier, when FSN began, the World Wide Web was just getting started, and the Internet was something for government, education, and research.

As summer turned to fall, suppliers of new equipment needed to roll out enhanced services were lagging far behind their committed dates, leaving cable's creaking infrastructure in need of upgrade. Clocks were ticking loudly as telephone companies tested both wireline (xDSL) and wireless (MMDS) technologies in an effort to find the shortest paths to market. Buried deep in the northern midwest, a simultaneous trial of cable modems and xDSL was revealing that users couldn't tell the difference between the two. Both were so much faster than regular modems or ISDN that it didn't matter that cable modems were three times faster than xDSL modems. The user's PC and/or a Web site couldn't run fast enough to keep up with either technology, so the advantages blurred.

Follow the Money

Now it's time to play "follow the money." Given that time to market is key to long-term success—if not survival—and given long cycles to roll out new product (one to three years), what products should be brought to market over which infrastructure? While the cable industry agrees that a hybrid fiber/coax (HFC) architecture is the way to go, the problem remains that there are several versions of HFC—all vendor specific. The HFC solution determines which services can be deployed.

Ignore all the hype about "video on demand" (VOD) that has clouded the issue over the past two years. The most crucial issue facing the cable industry today is system capacity. The combination of questionable regulation by the FCC and caution exercised in waiting for some clear standard for broadband cable to appear has resulted in all channels being consumed at the local system level. With channel capacity exhausted, no new channels or services can be deployed. The promise of digital video is channel replacement, where an analog video channel carrying one program can be replaced with a digital signal carrying multiple programs. Current digital video compression technology supports four to six digital channels as a replacement for each analog channel. Evolution of this technology will support 10 (and later 20) digital channels per analog slot. So, digital video offers expansion of the system capacity, creating the space for new channels and services that will generate the revenue needed to finance conversion to a broadband plant.

Two years ago, the plan was to go all-digital as quickly as possible. Vendors charged forward in developing digital set-top boxes that would replace the existing generation of cable converters. Delays caused by technology and cost forced both cable MSOs and manufacturers to rethink the strategy, especially in the face of soft revenue forecasts for interactive services including VOD. Given the huge costs to deploy early digital infrastructure, including video servers and set-tops which only existed as lab prototypes, the entire cable industry pulled back. What evolved is an "advanced" analog set-top capable of providing low-resolution graphics with an upstream capability that supports only minimal interactivity, but can receive digital video signals and decompress them.

Video Only Model

The basic service sets that cable wants to deploy are digital video, two-way data communications, and telephony. To do this, a baseline capability must be put into place that will support these services. The cost for this is measured in two ways: first, as a cost per home passed; and second, as a cost per subscriber. The basic average cost on a per home basis for providing a video only capability is shown in Table 1.

The per-home-passed measurement reflects the basic construction cost to put the system in place. If cable had a 100% subscription rate, this would be the basic cost to deliver service to the home. But cable

**Table 1
Cost Per Home Passed—
HFC For Video Only**

<i>Electronic Equipment</i>	
Headend	\$50
Host Digital Terminal	N/A
Fiber Node	\$15
Digital Video	\$40
Power	\$15
Total Electronics	\$120
<i>Media</i>	\$110
<i>Installation</i>	\$100
Total Per Home Passed	\$330

Source: S. Evans

subscription is in the 60% to 65% range. Further, the true cost must be measured based on actual subscription, which is optimistically projected at 20% at a mature rate. This means that the cost per subscriber will be much higher, since new revenues will come from a small percentage of subscribers who will pay fees for additional services. Based on a 20% subscription rate and the addition of an advanced analog “hybrid” set-top to receive the digital video, the actual cost per subscriber is shown in Table 2.

Subscription to the new enhanced service is projected at \$19.95 per month, in addition to the cost of basic cable, to offset the cost of build out. Additional fees will be charged on a per service basis. The services that are expected to generate revenue in this scenario are an interactive program guide and higher buy rates for pay-per-view movies and events. The interactive on-screen guide giving details on programs is expected to sell for \$3.00 per month, or about the same as a subscription to *TV Guide*, the popular weekly magazine. Pay-per-view movies will cost \$3.99 to compete with the local video store, and the target

**Table 2
Cost Per Subscriber—
Digital Video**

HFC Distribution	\$1,650
Network Interface Device	N/A
Media	\$10
Installation	\$30
Hybrid Set-Top Box	\$500
Total Per Subscriber	\$2,190

Source: S. Evans

buy rate is three per month per subscriber. Other transaction-based services, such as shopping, will generate additional revenues. The combination of revenue streams is forecast to net the cable operator \$17 per subscriber per month on a normalized basis. Based on a 60-month amortization, the cost per subscriber is \$558 per year. Combined income per subscriber per year is \$443.40, yielding a loss of \$114.60 per subscriber per year. As shown in Table 3, this is not a healthy business proposition.

**Table 3
Basic ITV ROI Per Subscriber**

<i>Annual Cost Per Subscriber</i>	\$558.00
<i>Income Per Basic Subscriber</i>	
Basic Interactive Service	\$239.40
Transaction Revenue	\$204.00
<i>Total Revenue/Basic</i>	<i>\$443.40</i>
ROI Per Basic Subscriber	(\$114.60)

Source: S. Evans

Internet Only Model

The basic upgrade of the cable plant provides for limited two-way communications, which is enough to support simple interactivity using the advanced analog set-top. This allows a new set of services to be rolled out, primarily an enhanced PPV movie service based on more movies with shorter start times over digital channels. But it doesn't support the high-speed data communications capability that is needed for an enhanced Internet access service. For that, a cable modem in the cable subscriber's home is required, along with additional equipment at the system headend. This drives the cost base to provide service even higher. The first generation of cable modems

**Table 4
Cost Per Subscriber—
Cable Modem**

HFC Distribution	\$1,650
Network Interface Device	N/A
Media	\$10
Installation	\$30
Hybrid Set-Top Box	\$550
Total Per Subscriber	\$2,240

Source: S. Evans

costs approximately \$500, with one per subscriber and enough units at the headend to accommodate service demands. Using the same HFC infrastructure, the cost per subscriber is shown in Table 4.

The current price structure for high-speed cable modem access to the Internet is \$39.95 per month. This includes an account for unlimited access and an e-mail address. This is roughly twice the industry level of \$19.95 per month for an account providing unlimited access and e-mail, but the cable-based service provides performance improvements of 10 to 50 times that of an analog modem over a telephone line, depending on which cable modem is used. Using the same schedule as the digital video model, the annual cost per subscriber is \$571 against revenues of \$479.40, resulting in a loss of \$91.60, as shown in Table 5.

**Table 5
Internet ROI Per Subscriber**

<i>Cost Per Subscriber</i>	\$571.00
<i>Income Per Basic Subscriber</i>	
HFC Internet Service	\$479.40
Transaction Revenue	\$0.00
<i>Total Revenue/HFC Internet Sub</i>	\$479.40
ROI Per Basic Subscriber	(\$91.60)

Source: S. Evans

Video + Internet Model

The numbers work a little better when the subscriber takes both the digital video and Internet service. The subscriber now gets two boxes, a hybrid set-top and a cable modem, along with heftier service fees. The costs are shown in Table 6.

**Table 6
Cost Per Subscriber—
Digital Video/Internet**

HFC Distribution	\$1,650
Network Interface Device	N/A
Media	\$10
Installation	\$30
Hybrid Set-Top Box	\$500
Cable Modem	\$550
Total Per Subscriber	\$2,740

Source: S. Evans

The good news is that the combined revenue streams now put the cable operator over the top into a positive cash flow, as shown in Table 7. The real question is how many subscribers will fit this model. The penetration of personal computers in cable households may not be high enough to support a combined service subscription penetration of 20%, which is required to make this model work. Cable operators love to bundle services at a discount, but even small discounts on these services erode margin quickly.

**Table 7
ITV Internet ROI Per Subscriber**

<i>Cost Per Subscriber</i>	\$699.00
<i>Income Per Basic Subscriber</i>	
Basic Interactive Service	\$239.40
HFC Internet Service	\$479.40
Transaction Revenue	\$204.00
<i>Total Revenue/HFC Internet Sub</i>	\$922.80
ROI Per Basic Subscriber	\$223.80

Source: S. Evans

The test will come when competition arrives. The telephone companies are expected to use predatory pricing to capture market share, and, in almost every case, they will be competing for the same customer as the cable operator. For this reason, Wall Street feels that the true mass market value for cable access to the Internet is really \$24.95 per month, not the \$39.95 early adopters are paying. One of the top five cable MSOs took issue with this price point, arguing that it was costing them \$19 per month per subscriber to provision Internet service, and was it only worth \$6 per month for the added value of the cable modem? The reality of it is that provisioning costs are high because all cable operators are still at the high end of the cost curves, and they must bring their operating costs down as quickly as possible if they are to remain competitive.

Video + Voice Model

The last service set is telephony, the service which could become the largest source of revenues. This is also the service with the highest barrier to market entry. In order to provide telephony services over the cable plant, a third set of specialized equipment is required. This equipment is by far the most expen-

sive—not to mention the regulatory costs and hurdles that must be overcome in order to deploy telephone services. A significant cost per home passed is the host digital terminal equipment required to provide dialtone and network access. These costs are shown in Table 8.

Table 8
Video/Telephony Cost Per Home Passed—
HFC For Video & Voice

<i>Electronic Equipment</i>	
Headend	\$50
Host Digital Terminal	\$140
Fiber Node	\$125
Digital Video	\$15
Power	\$30
Total Electronics	\$360
<i>Media</i>	\$120
<i>Installation</i>	\$110
Total Per Home Passed	\$590

Source: S. Evans

The current forecast for local and long distance service, normalized on a per subscriber basis, is \$35 per month. This is below the current figures for dominant franchise-provided service, but the price point for basic service must be extremely competitive if the cable operator is to realize the 15% market share projected by the analysts. The probability of a cable subscriber taking both digital video and telephone service is high, and the network interface required is approximately \$100—significantly less than the cable modem increment. The assumption is that telephone service will only be available as an increment of the basic interactive product, resulting in the costs shown in Table 9.

Table 9
Video/Telephony Cost Per Subscriber—
Digital Video & Telephony

HFC Distribution	\$2,950
Network Interface Device	\$100
Media	\$30
Installation	\$30
Hybrid Set-Top Box	\$500
Total Per Subscriber	\$3,610

Source: S. Evans

The bad news is that the additional costs to support the telephony functions overwhelm the additional revenue generated, resulting in a \$57.60 loss per year. Even the \$35 per month income stream is optimistic, as the dominant franchise provider will defend its subscriber base ferociously. Further, the costs shown here do not include the legal fees required to resolve the regulatory and interconnect issues. Cable operators face minimal regulatory administrative costs today, regardless of their cries otherwise. The bone thrown to the competitors of the dominant franchise service provider in the Telecommunications Act of 1996 was a steep discount for interconnect to the existing network. The telcos are fighting this in every venue, arguing (quite rightly) that the discount stipulated is greater than their margin—Why should they be forced to subsidize their competitors? The bad news for the cable operator is shown in Table 10.

Table 10
Video/Telephony ROI Per Subscriber

<i>Cost Per Subscriber</i>	\$921.00
<i>Income Per Basic Subscriber</i>	
Basic Interactive Service	\$239.40
Local/Long Distance Service	\$420.00
Transaction Revenue	\$204.00
<i>Total Revenue/ITV/Voice Subscribers</i>	<i>\$863.40</i>
ROI Per Basic Subscriber	(\$57.60)

Source: S. Evans

Combined Services Model

The last iteration in our model combines all three services. So far, the only thing worth doing is to campaign for subscribers to take the basic interactive service in combination with the Internet service. Combining all three results in the highest cost per subscriber as shown in Table 11.

As shown in Table 12, the combined revenues cover the costs—but just barely. The good news is that a combination service could be a winner with subscribers. The bad news is that it's hardly worth doing; it is necessary, however, because the local telco will have a similar package.

Just for the record, the five-year projections are shown in Figure 1.

Table 11
Combined Cost Per Subscriber—
Video/Internet/Cable

HFC Distribution	\$2,950
Network Interface Device	\$100
Media	\$30
Installation	\$30
Cable Modem	\$550
Hybrid Set-Top Box	\$500
Total Per Subscriber	\$4,160

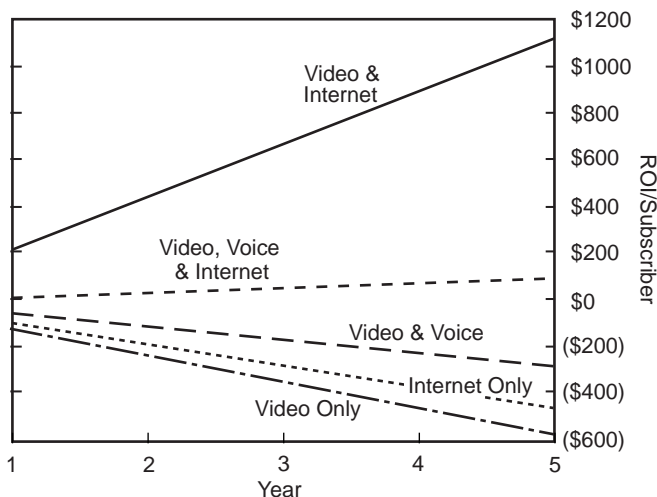
Source: S. Evans

Table 12
Combined ROI Per Subscriber

Cost Per Subscriber	\$1,061.00
Income Per Basic Subscriber	
Basic Interactive Service	\$239.40
HFC Internet Service	\$479.40
Local/Long Distance Service	\$420.00
Transaction Revenue	\$204.00
Total Revenue/ITV/INET/Voice Subscribers	\$1,079.40
ROI Per Basic Subscriber	\$18.40

Source: S. Evans

Figure 1
Five-Year Projections



Source: S. Evans

Conclusions

Based on these numbers, the logical conclusion is to sell rather than fight. These numbers reflect the “early” days of HFC deployment, and they should come down significantly once the vendors to this industry move further up the learning curve. The ROI results should not come as a surprise to any observer of the broadband environment. Similar numbers were filed with the FCC Carrier Bureau two years ago by the regional Bell operating companies for their video dialtone networks. In those analyses, the breakeven point was between nine and 12 years due to the heavy cost of deploying a fiber optic-based infrastructure burdened with early ATM switching products. This is always the case with basing service deployment on new and/or emerging technologies, so it came as no surprise that, even with deep pockets, the telcos decided to back away.

Times have changed—at least for the cable industry. The franchise is at risk to multiple forms of competition, and to delay may take them out of the game before it begins. On the positive side, the hybrid set-top box will come down in cost once semiconductor manufacturers see what functionality is required and begin to provide higher levels of integration. The top five MSOs, which represent almost 70% of the market, are already pushing for a combined set-top that would provide the full range of functionality in a single unit at the same \$500 each type of unit costs today. The bad news is that the cost of deploying fiber optic technology has not dropped significantly—nor will it any time soon. The good news is that the telcos have a similar problem with xDSL, which costs roughly the same per subscriber to deploy today as HFC. They both have the next two years to resolve the cost issues. Today, statistics show that 5% of the 11,000 cable systems have full HFC capability. That equates to roughly 8% of urban/suburban systems, so it is not surprising that forecasts of HFC availability through the year 2000 remain so low.

An alternative being pursued by many cable operators is to deliver a digital signal to the subscriber over the near term without deploying HFC. This is the HITS (Headend In The Sky) concept originally developed for smaller systems that could never reach enough subscribers for the economics to work out. In this scenario, the digital video signal is transferred from the satellite downlink and sent out over the cable without any supporting equipment at the cable headend. The hybrid set-top decodes the digital

stream and delivers the signal to the subscriber's TV. The asymmetrical arrangement discussed earlier would support low levels of interactivity, including Internet access but not telephony. The technology works, but deployment of hybrid set-tops and one-way cable modems does not provide as robust a product as the full broadband HFC architecture.

More important, standards are beginning to take hold. Cable operators have learned what telcos have known for years: Standards are key to interoperability and driving costs down. Cable has been held back by proprietary systems, limiting their ability to deploy

new service to the capabilities of their headend equipment vendor. This has also prevented them from taking advantage of the volumes created by standard functions, keeping costs artificially high. The agreement between all parties to standards for interoperability between set-tops was reached in October, as was a standard for cable modem technology and transport. This will drive the cost curves within the next year as compliance to these standards takes hold. Then, deployment can begin at a level where quality of service and the value proposition to the subscriber are the determining factors. nto



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