

Rebooting the Regulatory Operating System—

The Computer Industry Turns on the Power

Joan Van Tassel, Ph.D.

[The telcos could accelerate higher-speed Internet access if they would] bring down the price of ISDN. For us, that's like encouraging Intel to make fast chips. We want communications to be infinite bandwidth and free, just like we want chips to have infinite speed and be free.

—Bill Gates, Microsoft¹

The shot that signaled the arrival of the information technology (IT) industry into the political arena was fired on December 28, 1995, when most of the leaders of mega-business were celebrating the holidays in Boston, Philadelphia, Virginia, or Sun Valley. It reverberated in empty boardrooms around the United States, but its message was loud and clear: The very grounds of U.S. communication policy and practice were about to shift in ways that would ultimately touch everyone in America.

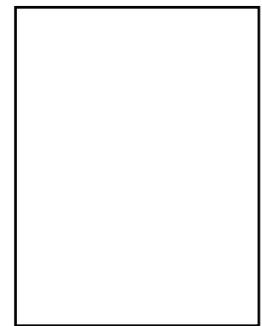
The agent of the shot was Dhruv Khanna who, in the midst of all that festivity, had spent most of the week closeted in his office around-the-clock preparing to mount an entirely unexpected offensive action against U S WEST in the state of Washington. On the rainy, windswept, cold, and dark morning of December 28, he was in his Dodge Colt, dodging the big rigs on Interstate 5 as he made his way to Olympia, Washington's capitol, to personally deliver the opening salvo in the first great battle for the digital destiny.

The opening quote by Bill Gates is a dispatch from the front lines of the battle that began that day, a continuing struggle between the emerging digitally-based information industry and traditional analog-based entertainment, consumer electronics, and telecommunications industries. It reflects only one dimension of the several conflicts now raging between rapidly-expanding computer companies and the influential, entrenched communication-related business sectors.

We read reports from each skirmish in the pages of our newspapers' business section, but they provide only the daily body counts rather than covering the overall war in all of its scope. Essentially, this story is about an extraordinary industry coming of age, its entrance into the domain of public policy and regulation, and its demands for changes in the way business-as-usual is conducted.

Measured purely by economic growth, computer hardware, software, and services have grown exponentially in the last decade. As long as computers were used primarily as computational devices, information companies could focus on research and development, product design, manufacturing, and marketing, reaping the profits from the exploding adoption of their technologies in both the domestic and international markets.

However, now that computers have entered the realm of communications, this



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nascent industry is thrust into a heavily-regulated, highly-profitable, innovation-resistant, slow-moving arena. This is an unwelcome and uncomfortable development for an industry that has thrived in the crucible of the market, and that has been relatively unconstrained by regulation or even convention.

This observation is not meant to suggest that the information world is without principles, ideals, or practical restraints. Indeed, commonly-held industry-wide core beliefs and cultural practices are a primary cause of the recent initiatives advanced by the information technology interests in the political and regulatory arenas. So fervently do IT managements believe that their positions are inevitable, right, true, and representative of “The American Way” that they are pushing against four distinct communication-related industries to make room for them at the public table with the righteousness of true believers.

This article begins with a description of these core beliefs and practices that are so highly-regarded within the IT pantheon. It will then describe the factors that are propelling IT companies to action and the fears this creates in other communications sectors. From there, the article will detail the inter-industry conflicts that have arisen

and the actions the information interests are taking to pressure the government and existing industries to meet the needs of digital technologies. Finally, after covering the scorecard of IT efforts, the article will examine the potential for moving from conflict to collaboration between these groups.

The Digital Destiny

[D]igital creation and display will predominate over other forms of communication—telephony, broadcasting—at the workplace as well as in our personal lives. Digital display will also subsume all other forms of storing information—libraries (personal and public), professional records, photo albums.

—Andrew Grove, Intel²

Cultural approaches to the workplace typically consider the beliefs, norms, rules, and stories within single organizations. However, this perspective falls short when it comes to IT companies, because there is an identifiable industry-wide culture that is similar across organizations. While there may be differences between the corporate cultures of Intel and Apple, they are more like one another than either is to any



telephone company or consumer electronics manufacturer.

One distinguishing feature of the IT industry is its hyper-turbulent business environment, which has resulted in a constant round of buyouts, mergers, and failures and, thus, an extremely mobile workforce. Few employees last long enough to collect their gold watches when they retire.

One of the most fundamental beliefs of people who work in IT is that the rise of digital technology is historically inevitable. In an interview, Paul Misener, Intel's savvy Washington, D.C. representative, casually observed that it was only a matter of time before the computer would be *the* communications appliance in the home. "Why? Because it's a general purpose machine that replaces the telephone, fax machine, television, CD player, DAT, and even takes over home security and regulation of power consumption," he answers immediately, quite evidently surprised to be asked the question at all.

Digital data is the stuff of legends, an infinitely flexible, low-cost, long-lasting communications medium—the alchemist's ultimate dream of dross turned into gold come true. In the article quoted at the beginning of this section, Andrew Grove describes the benefits of digital communication. All information can be expressed, transported, and stored in digital form. Relatively inexpensive media, such as the CD-ROM or the DVD, store massive amounts of information that are virtually indestruc-

tible. Finally, digital data can be transported almost instantly around the world—the fastest, cheapest mechanism for carrying information ever devised, as shown in Table 1.³

According to *InfoWorld*, more than 186 countries receive e-mail, even though 98% of the computers with access to the 'Net are in industrialized countries. "The Internet will be much more important to the poorer countries of the world than it is to their wealthier neighbors. It's a type of reverse colonialism. For a relatively small cost, citizens of developing countries can exploit industrialized wealthy nations for an endless supply of that precious commodity—information."⁴

As computers became more capable of replacing and simplifying existing tasks, they also grew ever more awesomely sophisticated. The evolution of hardware has made it possible for what most people thought of as a computational device to become a technology of communication, capable of handling voice, data, and high-quality audio and video. "Since the invention of the integrated circuit in 1961, the number of transistors contained in a single chip has increased one million-fold," writes Federico Faggin, noting that it is now possible to make 10 million transistor microprocessors and that, in 12 years, that capacity will increase to one billion. Similarly, programmable chips now incorporate 10,000 to 100,000 logic gates, but in 12 years, that will grow to between one million and 10 million gates.⁵

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Table 1
Relative Costs of Document Delivery

Delivering a 42-Page Document from New York to	New York	Los Angeles	Tokyo
E-mail	9.6 Kb/s/\$0.28	9.6 Kb/s/\$0.28	9.6 Kb/s/\$0.28
US Air Mail	2 days/\$3.00	2 days/\$3.00	3 days/\$7.40
Overnight Service	1 day/\$15.50	1 day/\$15.50	1 day/\$26.25
Fax	31 min./\$0.44	31 min./\$9.85	31 min./\$28.83

Source: UUNet/MFS

The attitudes of the enormous industries are like the staid businessman who plays moth to the flame of a beautiful and wild woman.

While the digitization of information is certainly a wondrous thing, it is also true that analog signals are sometimes more cost-effective to store and less costly and difficult to access. One example is videotape as an archive for moving images. As one wag put it, "Never underestimate the bandwidth of a station wagon carrying a couple of crates of videotapes."

Further, ever more sophisticated analog microprocessors are being designed and marketed. Nevertheless, the impressive advances in the speed and capacity of digital technologies have far outstripped almost all other areas of endeavor and have made much innovation possible in many other fields such as health care. Despite the conceivable power of analogical computation, based on biological principles, the digital computer has proved so useful that it is difficult to imagine a near-term future which does not increasingly depend on it.

The historical inevitability of the digital destiny is the center of gravity of the information industry's belief system, but there are other important principles. They include:

- "A paranoid attitude toward government regulation" (as an executive from the entertainment industry put it).
- Commitment to open standards (not including Microsoft and a few other companies).
- Abiding faith in the virtues of competition and the market mechanism.
- Enthusiastic adoption of innovation.
- Acceptance of merit as the basis of decision making.

Taken together, it is interesting to note that they are classic American attitudes and ideals in an industry that is anything but traditional. While other industries pay lip service to these ideals, the people who work in IT actually try to live by them. The result is that, in addition to the very real business conflicts engendered by digital products, there is also a cultural abyss that makes the players talk "by" each other, rather than "to" each other.

Robert Cringely summarizes the beneficial consequences of this value system nicely: "Bad products die early in the marketplace or never appear. Good products are recognized earlier. Change accelerates. And organizations are forced to be more honest. Most especially, everyone involved shares the same understanding of why they are working: to create the product."⁶

Table 2 compares the IT industry's belief system with the belief systems that the IT people attribute to other business sectors they must now deal with as computer technology enters the realm of mass communication. It does not address how these others *really* are; rather, it reflects the way many IT people perceive and talk about them.

A Gorilla in Their Midst

[The 'Net] is much more than a new communication medium, the study says, it is a model in miniature of the communications industry of the 21st century... The 'Net is a disruptive technology which will completely reshape the market, forcing the convergence between telecoms, information technology, publishing, and broadcasting.... The 'Net already provides personal computer users with entry to a burgeoning market for every type of service, from on-line wine sales to samples of movies and music, pornography, and the Vatican library.

—Alan Cane, Analysys Publications⁷

The attitudes of the enormous industries enmeshed with digital technology companies are ambivalent. They are like the staid businessman who plays moth to the flame of a beautiful and wild woman: They would like to reap the rewards of intimate association, but they're afraid they'll get burned, spurned, and left flailing about in the dust of their demolished dreams. Companies that manufacture products or produce content for the telephone, broadcasting, film, audio equipment and music, video game, copying

machine, and fax industries all depend on digital technology for efficiency and cost-reduction. Yet, they face competition from that same technology.

While most sectors must be satisfied with a rate of growth that falls between 2% and 10%, generating like profits, the expansion of the information industries must be regarded with astonishment and envy. For example, in 1990, computer industry revenues were about \$19 billion; in 1997, they will reach nearly \$46 billion. In 1993, global sales of multimedia-capable PCs totaled 2.5

million units; in 1994, that figure quadrupled to 10.3 million units.⁸ Research from Frost & Sullivan predicted that multimedia hardware and software would grow from 1993's \$4.9 billion to more than \$22 billion by the year 2000.⁹ Dataquest reported that 1996 was a poor year: The worldwide PC market grew only 25%, and the U.S. market was limited to 19%.

Whole industries created by digital computer technology seem to turn to gold, even if, in hindsight, there are plenty of business failures as well. In less than five

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**Table 2
Comparison of Industry-Wide Cultures and Attitudes**

	Local Telephone Industry	Broadcast Industry	Film Industry	Consumer Electronics	Computer Industry
Regulation	Heavy; use influence for profit	Heavy; use influence to bar entry	Light; use influence on trade issues	Moderate; mainly safety and electrical	Changing to heavy reg. of telecom.
Standards	Gov't-set; mandatory; permanent; restricted	Gov't-set; mixed mandatory/voluntary; open	Industry-set; voluntary; changing; open	Mostly industry set; changing; open	Mostly industry-set; very fluid; open
Inter-operability	Proprietary, for LECs and LD cos.	Voluntary	Voluntary	Voluntary	Voluntary
Innovation	Resistant	Resistant	Ambivalent	Open	Enthusiastic
Response to tech. change	Slow	Slow	Moderate	Rapid	Warp-speed
Competition	LECs - None IXCs - Intense	Past: Strong Present: Intense	Intense	Intense	Intense
Mgmt Style	Conservative; hierarchical	Exploitive; hierarchical	Clique of insiders; hierarchical	Conservative; hierarchical	Merit-based; hetarchical
Profitability	Subsidy and guaranteed	Market return; Lobbying expertise	Market	Market	Market
Lobbying Efforts	Massive at federal and state levels	Moderate to heavy at federal level	Moderate; Trade issues at federal level	Moderate; Trade issues at federal level	Slight; Trade issues at fed. level
Communication	Formal; corporate	Informal; bland	Informal	Formal; corporate	Informal; blunt

Source: J. Van Tassel

Separate studies show that on-line usage is a factor in the erosion of the television viewing audience. Magazine and newspaper publishers can expect to be affected as well.

years, Hambrecht & Quist estimated the market value of publicly traded Internet-related companies at \$6 billion and predicted it would be a \$13 billion industry by the turn of the century.¹⁰ Companies that design and manufacture switches for computer networks are growing at 400% per year, bringing in \$5 billion in 1995. The leading company in that business, Cisco Systems, is valued at more than \$20 billion—nearly as much as Bell Atlantic and larger than Pacific Telesis.¹¹

While some related industries benefit from their contact with digital technology, there are plenty of examples of businesses that do not. Moreover, some parts within an industry may gain from closeness, while other parts suffer. Predicting future winners and losers is historically difficult and inexact, so an aura of uncertainty surrounds analysis and prognostications. What is certain is that no one wants to be in a business fighting it out on the competitive battlefield, armed only with obsolete technologies and out-worn practices.

As noted in the previous section, computer networks are the least expensive way to send information, causing some concern within the U.S. Post Office. Another victim of the versatile PC is the once-thriving videogame market and their dedicated players. In 1994, game sales topped 30 million units; in 1995, sales reached more than 40 million games. However, in 1994, games designed for the PC grew 21% and, in 1995, PCs acquired a 25% share of market, while 16-bit video game software declined by 14% and sales of player hardware fell 36%.¹²

By April 1996, a Consumer Electronics Manufacturers Association (CEMA) survey reported that 88% of teenagers (the heaviest purchasers of games) said they would choose the PC if they had a choice. A majority, 54%, said they already spend more time with the PC than they do with games.¹³ Some analysts believe that PCs will continue to erode this market; however, manufacturers of videogame players are fighting for their market share by introducing higher-quality 32- and 64-bit players.

Broadcasters are also wary of the computer's power to draw people's leisure time away from television, especially among on-line users. Separate studies by Coopers & Lybrand, Jupiter Communications, Odyssey, and Forrester Research show that on-line usage is a factor in the erosion of the television viewing audience.¹⁴ The Forrester study indicated that, beyond the television industry, magazine and newspaper publishers can expect to be affected as well.

Nor are there signs that computer use, including for communication, will decline. The demand for home communication has increased steadily since 1985, when U.S. households had only basic telephony. By 1990, cable subscription brought the average up to 1.2 services per household. In 1995, that average rose to 2.2, including second lines, cellular, paging, and on-line access services. An estimate from the Washington, D.C.-based research company, MTA-EMCI, predicts the average will reach 3.2 services in 2000.¹⁵

Even though the growth rate of U.S. home computers may fall in the next few years, PC penetration will likely reach 50% around 2000. Even more indicative of the future is a survey by Custom Research, Inc. which found that 99% of people born after 1971 (who will be 26 in 1997) used a computer before they were 10 years old. More than 66% of them labeled themselves as "intermediate," "expert," or "power" users. This generation contrasts sharply with the data from people born before 1971. Only 7% used a computer before age 10, and 19% consider their computer ability to be intermediate or above.¹⁶

Nearly all the people who are the decision makers in the business world were born before 1971. Most executives have secretaries who answer their e-mail, and senior managers are reluctant to admit to their junior employees that they don't know how to use a computer. Most had hoped to retire before facing the full impact of digital technology, and now fear they may not make it in time.

The rapidity of digital diffusion generates a climate of uncertainty and fear in

other communication industries. The response by many companies to the changed business environment of instant ubiquitous communication has been to continue following the procedures that have always worked, whether or not they are effective in this new world.

The eagerness of IT companies to establish digital dominance, their no-nonsense and forthright language, and their intense belief in their manifest destiny has caught other communication sectors by surprise. Many managers seem barely aware of the growing pains of convergence until an IT representative ambushes them in a consumer agency, standards committee, court, or public utility commission.

Perhaps fewer still recognize that there is an enormous realignment taking place along many fronts of the convergence landscape, beyond the confines of any single business arena. Table 3 summarizes the conflicts that have arisen between the IT industry and other communication-related sectors—the local telephone companies, television broadcasters, the Hollywood film community, and consumer electronics manufacturers. The next section will examine these simultaneous conflicts.

The Local Telephone Industry: The Immovable Meets the Unstoppable

I was quite surprised by [computer companies' filing against RBOC ISDN

rate raise requests].... We worked very well with them to enable videoconferencing with ISDN.

—Mary Hancock, Pacific Bell¹⁷

The 'Power' Trip: Computer Folks Are Being Nice to Cable to Get the Bells in Line.

—Cablevision¹⁸

Logically, there shouldn't be much conflict between local telephone companies (local exchange carriers or LECs) and the computer industry. Each benefits from the core business and technical expertise of the other. They are mutually dependent upon one another—computer communication requires a transport network; LECs profit when customers make more calls by replacing "snail mail" with fax and e-mail.

This seemingly win/win situation has transformed into a zero-sum game, with both parties locked into an adversarial relationship, filled with miscommunication and bitter recrimination. The sparring began as early as 1980 with the first of the Federal Communications Commission inquiries that attempted to make a distinction between information processing and communication. After the second inquiry (called Computer Inquiry II or CI II), the FCC limited common carrier regulation to basic services and exempted enhanced service providers (ESPs) that offer such services as access to a database, Internet access, and voice mail. In this series of arguments, the IT industry

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**Table 3
Conflicts Between Different Sectors of the Communication Industry**

Local Telephone Industry (LECs)	Broadcast Industry	Film Industry	Consumer Electronics Industry
Last mile - low bandwidth - failure to implement ISDN standards - failure to implement ADSL Access reforms for ISPs	Digital TV transmission standards. Delivery mechanism. Spectrum allocation.	Protection of intellectual property - DVD encryption standards - WIPO - Internet	Digital TV set/receivers standards. DVD encryption. AC-3 Dolby vs. MPEG-2

Source: J. Van Tassel

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argued in favor of the ESPs, while the LECs were opposed to their exemption.

A similar division occurred over the FCC's proposed Open Network Architecture, which would allow all companies equal access to the LEC networks. In practice, this would mean that standardized interconnection to any network function would be possible, a concept referred to as "un-bundled" service. Naturally, IT companies were in favor of the open architecture, while the LECs successfully resisted the initiative through intense lobbying, obfuscation, foot-dragging, and outright refusal to perform.

This opposition is based on sound business realities. The local telephone companies are not anxious to see their profits eroded by competition in the local loop, which open standards would make much easier.

Yet, IT companies require open standards because of the cost of product development. "Cringely's Second Law states that in computers, ease-of-use with equivalent performances varies with the square root of the cost of development. That means that a computer that's 10 times easier to use...would cost 100 times as much money...[so] the next generation will cost around \$5 billion.... The only place such a computer is going to come from, in fact, is a collaboration of computer and semiconductor companies. That's why the computer world is suddenly talking about open systems, because building hardware and software that plug-and-play across the product lines and R&D budgets of a hundred companies is the only way that the future is going to be born," writes Robert Cringely.¹⁹

According to Mark Jamison, director of telecom studies at the Public Utility Research Center at the University of Florida, the computer/telco conflict has changed since the early clashes. "The conflict before was how to divide up markets. IBM wanted to encroach on AT&T and vice versa. So, there was a collision between companies going in the same direction from different directions.

"What we have now is that the industries are interdependent and the service the

telephone companies have traditionally provided doesn't fit with what the computer companies want. The telephone companies offer narrow, dedicated bandwidth. The computer industry wants high-bandwidth networks that can handle bursty traffic. Fundamentally, the telephone network and pricing don't fit what the computer world needs," says Jamison.

LEC Requests for ISDN Rate Hikes

Ironically, the opening challenge to the local telephone companies was precipitated by the LECs themselves when they requested substantial rate hikes for ISDN service. In Washington and Arizona, U S WEST tried to raise the flat monthly fee from \$63 to \$184. In New Mexico, they wanted \$189 per month. California's Pacific Bell asked to replace its \$24.50 off-peak flat rate with a rate of \$32.50 for 20 hours and metered service thereafter, ending the off-peak discount entirely.²⁰

Unbeknownst to the LECs, this action posed a direct threat to the business concerns of microprocessor chip and computer manufacturers. Dhruv Khanna, Intel's former legal counsel who represented the computer industry in the IT industry's most recent jousts with the local telcos, explains the reasoning that prompted the first action against the LECs.

In late 1995, market data indicated that the recent phenomenon of communication via computer would be driving the demand for more powerful machines. To enable network applications such as high-speed Internet access, videoconferencing, reliable telecommunications, and remote LAN telecommuting, computer communicators would need enormous amounts of raw processing power. In other words, the marketing message was that in order to sell ever-faster, more powerful chips and computers, consumers would need to be able to use them on higher-bandwidth applications. And for these apps, they would need robust, high-bandwidth networks.

"We needed more bandwidth at a mass market price point," Khanna recognized.

“So, we filed in state public utility commissions against the LECs’ requests to charge higher rates for home ISDN service. ISDN has been around for 15 years. At this point, the local telephone companies can provision 80% of the population with ISDN, making only minor hardware and software modifications. They don’t need to install any new fiber, no new switches, no new wire, so there’s no digging. But, they want to keep the meters running as long as possible.”

“The problem is that there is no competition in the local loop to give them an incentive to improve service and lower prices,” says Khanna, with some vehemence. Self-described as an attorney who will take on the telcos for his clients, Khanna has since started his own legal practice, Convergence Law Group, in Palo Alto.

The language about the LECs isn’t gentle. In the first draft of a filing against Pacific Bell in California, Khanna wrote in part: “...against Pacific Bell for violations of Sections 451, 453,...of the Code in offering and providing Integrated Service Digital Network (ISDN) services (i) at unreasonable and unjust rates and charges; (ii) with inadequate, inefficient, unjust and unreasonable customer service; and (iii) using unjust and unreasonable rules and practices.”²¹

In New Mexico, the computer companies advanced the following rationale in opposition to U S WEST: “In enhancing its analog POTS offering to ISDN service, U S WEST has demonstrated *all* of the ills of monopoly, including monopoly pricing, unavailability of service, and poor customer service. Not driven by competition, U S WEST has not been motivated to innovate and deploy and offer ISDN, which involves modest modifications to its analog POTS network.”²²

The rate hike requests showed the regulation-averse, independent, and competitive IT companies that they needed to band together and take a stand. So, although Intel acted alone against the LECs in Arizona, Texas,²³ Utah,²⁴ and Washington,²⁵ other companies in the IT industry soon joined to argue against ISDN raises. In California, Compaq filed with Intel against

Pacific Bell and, in New Mexico, U S WEST was opposed by a group of companies including Intel, Allied Signal, Motorola, Philips Semiconductors, Honeywell, and others, forming an alliance called the Technology Industry Association (TIA).

David Beats Goliath—So Far

Confrontations over ISDN in the local loop are fought out before state public utility commissions where the telephone companies enjoy a significant advantage in firepower. The computer industry has only a tiny Washington presence to deal with trade issues and has no people, offices, or representation on the ground at the state level.

Despite their relative disadvantage, in most of the states where the IT industry has intervened against LEC rate hikes, they have achieved at least some success. In Washington state and Arizona, U S WEST withdrew its proposals for \$184 per-month charges. In Texas, Southwestern Bell reduced its ISDN installation charge from \$485 to \$250, with further reductions for agreements for long-term service. In New Mexico, U S WEST reduced its monthly flat fee for ISDN from \$189 to \$75, and on May 13, the New Mexico Corporation Commission ordered U S WEST to establish ISDN residential flat rate service for \$40.86 per month.

In Delaware, the digital forces were represented by James Love, head of Ralph Nader’s Taxpayers’ Assets Project, which filed on behalf of consumers against Bell Atlantic’s request for \$249 per month flat rate ISDN service. The group won a signal victory when the regulatory agency ordered Bell Atlantic to establish service for less than 10% of the request—\$20.49 per month. As of this writing, the decision of the California Public Utility Commission has not yet returned its decision.

Access Reform

A second issue raised by the LECs also appears to have backfired against them by further unifying the IT industry. This time, it was the local telephone companies’ request to the FCC asking the agency to revisit the exemption of ESPs from paying local telco

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access fees. This action harks back to the Computer Inquiry II ruling in the early 1980s (described earlier) when the FCC first exempted businesses that offered telephone services that encouraged more use of the LEC networks. ESPs include database access providers and on-line and Internet service providers.

The telephone companies have chafed under that exemption even more since the massive increase of people coming on-line in 1994. In November 1996, the LECs petitioned the FCC to repeal the exemption and to consider Internet calls the same as voice calls. According to the telcos, Internet users stay on the telephone longer than the networks can handle, potentially triggering a disastrous breakdown of the public switched telephone network (PSTN).

Not so, say the computer companies and Internet service providers. The LECs are exaggerating. A statement issued by Paul Misener, Intel's key Washington lobbyist, delivered a verbal slap to the local telcos: "Rather than meeting the demand for Internet access, the phone companies want to suppress it by applying a surcharge."

Misener's accusation of failing to respond to public demand echoes an oft-heard theme, as written into the Intel filing against U S WEST in Utah. In a section entitled, "Reasons for the RBOCs' Non-Responsiveness to the Demand for Higher Bandwidth to the Home," Tad Hetu wrote, "The RBOCs seem to be focused on regulatory and public policy matters related to the passage and aftermath of the Federal Telecommunications Act of 1996, the setting of their POTS rates, and a host of other regulatory issues, acquiring cable companies outside their regions, merging with each other, and entering into the long distance business. Making greater bandwidth services easily and affordably available to the home does not appear to be a corporate priority."²⁶

Paul Misener, describes the IT companies' reactions to the telco move against ISPs at the FCC: "Several key PC companies recognized this access charge issue was important to the industry and that the Bells were telling the story that there is congestion

because PC users are putting a burden on the network when they connect to ISPs. The Bells' lobbying efforts began in earnest, showing studies of PC users clogging the network."

"A few of us got together from Intel, Compaq, IBM, Digital, Novell, and Microsoft sat down and said, 'What can we do? We've got to get organized.'" So, we formed the Internet Access Coalition (IAC), about a dozen companies and half dozen trade associations, all speaking with one voice."

The IAC is something new. For one thing, Microsoft is involved, which, on the whole, hasn't happened before. Previously, Microsoft was a member of the Business Software Alliance with Lotus, Oracle, Sybase, and other software companies, and often even preferred to fight its regulatory battles alone.

One of the first acts of the new alliance was to fund an independent study showing that Internet access is not the cause of network congestion. To no one's surprise, the study found that the telcos' failure to plan for overall growth of all uses of the network was the culprit behind network failures.

IT Wins Again

In this most recent head-on collision, the computer interests achieved an important victory when the FCC scheduled a *Notice of Inquiry* over the issue of ESP exemption from access charges. The LECs had requested that the FCC schedule a *Notice of Proposed Rule Making* (NPRM), which would have set the stage for the repeal of the ESP exemption. The IT contingent argued that the FCC should issue a *Notice of Inquiry* rather than an NPRM so that they could collect information without the pressure of possible new regulations. (An NOI cannot result in a change of regulations, which must be preceded by an NPRM.)

Members of the newly-formed IT lobby say that computer lobbying will provide important information to decision makers. They scoff at what they regard as the lame performance of the subsidy-dependent, non-

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competitive LECs. They see the RBOCs' desire to charge access fees to ESPs as just another way that fat and lazy telephone companies manipulate the political/regulatory system for profit instead of making money the old-fashioned way.

They insist that the computer companies will not emulate the regulatory behaviors they loathe in their opponents and that their efforts aren't lobbying as usual, with bourbon over a golf game. According to Paul Misener, the coalition has set up a series of technical meetings (about 20 so far) with the FCC chairman and his staff, making the IT industry's positions known and supporting them with detail.

Collateral Damage

Suspicion toward the telcos permeates the general population of computer users, well beyond the sphere of the IT companies themselves. For example, Jim Warren, Webmeister of the public interest listserve, Government Access, believes that the telephone companies are setting up a strategy similar to that of the oil companies in the mid-1970s. In Warren's scenario, telco warnings of network overload will be followed by massive failures and crises. The telcos will manipulate these problems to shove through a huge rate raise while everyone is panicked about loss of service.

The telephone companies naturally do not see the situation through the same lenses. They argue that network reliability is their most important responsibility to the public and that they are doing their best. And their chief responsibility to their stockholders, many of whom have purchased their utility stocks to provide a regular retirement income, is to maintain the level of dividends.

On the whole, the IT industry and the part of the public that wants to communicate with their computers find these arguments unconvincing, and the telephone companies have been unable to articulate their position convincingly to them. The LECs sometimes also undermine their own credibility. While telco technical people are fully conversant with digital technology, their sales and

media relations people are often woefully underinformed. If the Intel filings and Internet discussion groups of ISDN users are to be believed, members of LEC sales forces either lack knowledge or are entirely unavailable. In press interviews, the spokespersons occasionally make unbelievable, unsupportable, or accusatory statements that reveal their lack of understanding of computer users.

For example, a Pacific Bell spokesperson said to me in the most incredulous and disapproving tones: "Do you know that about 25% of those Internet users tie up their telephone lines for *hours?!?!?*" I asked her, "Do you have a computer on your desk attached to the company LAN?" "Yes," she said. "How often do you turn it off?" I asked—she did not answer.

The Broadcast Industry: TV Meets the New Vids on the Block

Bill Gates has held digital television hostage to his determination to move TV distribution to the desktop.

—A senior ABC executive

There are some people in cable who have felt that when it got down to the wire, the broadcasters would find a way to fumble the ball before they got [advanced TV] across the goal line.... In fairness, I think it's a combination of the broadcasters and politicians.

—Robert Rast, General Instrument Corporation²⁷

Will broadcasters, FCC derail digital TV?

—Headline in *CEA: Communications Engineering & Design*²⁸

The IT industry's relationship with television broadcasters has been no less contentious than it has been with the telephone companies. In arguments to persuade the FCC and key Congressional legislators (members of the House Telecommunications Subcommittee, the Senate Commerce Committee, and the Senate Communications Subcommittee) that their respective positions are right, the analog

The RBOCs' desire to charge access fees to ESPs is just another way that fat and lazy telephone companies manipulate the political/regulatory system for profit instead of making money the old-fashioned way.

The IT community pitted itself against the broadcast industry, the Grand Alliance giants, and the consumer electronics industry in the fight for a progressive scan standard that would be compatible with computer technology.

broadcast forces and the digital computer forces have engaged in a decade-long debate. At stake are the standards for advanced television, including high-definition television (HDTV) and digital television (DTV).

The clash is intensified by heightened fears of broadcasters in the face of the ever-growing Internet and the movement toward webcasting. Craig Birkmaier summarizes the nightmare scenario that haunts TV executives: “The hard-driving rhythms of a rapidly-emerging digital world are seeping away the foundation upon which the broadcast industry was built—the few-to-many paradigm, the gatekeepers of content for millions of faceless eyeballs. The digital beat is sweeping away the foundation upon which the cable industry was built—the narrowcasting paradigm, the gatekeepers of content for those trying to bypass the gatekeepers in broadcasting. Welcome to the DTV party! We are entering the era of *data broadcasting*.”²⁹

Even before the Internet explosion, local broadcasters were wary of HDTV and its close companion, digital TV (DTV). The problem of HDTV for them is the cost to individual stations of installing HDTV transmission equipment. The networks weren’t as concerned for their programming-provider functions, since the 35mm standard for entertainment programming is more than adequate for the higher bandwidth standard.

DTV was developed by General Instrument Corporation in the course of their work on their TV signal scrambling technology, DigiCypher. As broadcasters came to realize that digitizing their signals would give them more channels in the same bandwidth in which they now carry only one 6 MHz channel, their opposition lessened. Since the spectrum allocation to them was without charge, they began to mount a campaign to obtain the new spectrum for DTV—without the expensive HDTV baggage.

The members of the Grand Alliance (General Instrument, Zenith, Philips, and Sarnoff Laboratories) who had spent millions developing HDTV were outraged at the

prospect that the FCC might even entertain such a notion. “We’re being jilted at the altar here,” complained General Instrument’s Robert Rast.³⁰

However, it made far less difference to IT companies not in the Grand Alliance. Whether broadcasters adopt HDTV or DTV, they stand to benefit in two ways:

- (1) They will make the chips and decoder boxes that DTV entails.
- (2) TV signals will become computer-compatible.

Or so they thought, until it looked like the FCC might actually approve interlaced transmission and display standards for HDTV and DTV.

Interlaced or Progressive Scan?

Transmission and display standards are linked in that receivers must be able to decode the transmission format. The IT industry battled a determined campaign to dislodge the interlaced standard.

The current TV standard, NTSC, is an interlaced format, which means that 60 times each second, one-half of the picture is transmitted—first all the odd lines, then all the even lines. The gradual decay of screen phosphors used in TV sets and human “persistence of vision” tricks the brain into thinking it is seeing the whole picture.

By contrast, computer screens are designed for a progressive scan format. Here, every line of the picture appears in order, from top to bottom.

The IT community pitted itself against the broadcast industry, the Grand Alliance giants, and the consumer electronics industry in the fight for a progressive scan standard that would be compatible with computer technology. When it became clear they would lose a progressive-scan-only battle, they proposed dual-scan capable sets that would have both standards built in. However, the consumer electronics industry balked at this expensive proposition.

As the FCC decision on advanced television standards came down to the wire, with everyone predicting a “use it or lose it”

scenario for digital TV, these groups did find a compromise agreement that was a win for everybody. The deadline was December 31, 1996. On November 25, 1996, they made a pact to leave the transmission and receiver scanning format up to the market, with no mandated standard.³¹

The agreement left open the issue of whether digital spectrum would be auctioned or given free to broadcasters, but this was not of great interest to the other players. If television doesn't take up the spectrum, the chip-intensive mobile land services will use it. However, as a matter of principle, the IT industry opposes giving spectrum to broadcasters, asking "Why should they get a government handout no one else receives?"

Nor did the pact address the fears of the broadcasters of being eaten alive by yet another media delivery system, the Internet. Having already lost significant audience share—hence, revenue—to multichannel services (the cable industry and digital DBS satellite operators), local broadcasters are running scared.

Research continues to fuel their fears. According to Find/SVP, TV viewing declines dramatically when children have a PC available to them. Two-thirds of parents in 1,200 computer households reported that their kids watch less TV as a result of using the PC, and parents approve of the time spent on the computer. Surprisingly, girls use the computer even more than boys do until the 7th grade.

Networks, as programmers, are also concerned. Moreover, their future is tied to the fortunes of local broadcasting because an important source of their income comes from their affiliates and their highly profitable owned-and-operated local stations. As the Internet becomes capable of carrying broadband material, the minimum they will be forced to address is a changing business model.

Reeling from the erosion of audience share due to the added competition introduced by cable, the relationship between networks and affiliates has deteriorated. Now, new competition from digital media, including DBS and the Internet, make the

division even more rancorous. "The networks and the affiliates have a love/hate relationship. It used to be a true partnership, but now they screw each other regularly," observed one attorney who represents broadcast clients.

As with the telephone companies, the television industry faces very real business problems posed by the rise of IT communications. Similar, too, is the division caused by a perception of differing cultural assumptions and practices. Many IT people despise broadcasters' resistance to innovation and technical change, as well as the bland, middle-of-the-road, lowest-common-denominator communication style of much TV programming. They are also contemptuous of what they see as the television industry's practice of shameless lobbying and influence-peddling to block potentially competitive market entrants that might threaten their dominance.

However, it is easy to overstate the opposition between the two industries, which share some commonalities. They are both competitive businesses with largely market-defined winners and losers. Some people in television are more hopeful than fearful. They see the benefits of digital media and believe they present many opportunities.

The IT/TV Scorecard

The final decision on digital television was also a success from the IT point of view. In fact, all parties were pleased with the results of the final decision on DTV to allow market forces to decide the question of digital versus analog transmission and television sets. The Grand Alliance members were happy because it would get HDTV moving. The consumer electronics people were relieved to finally be able to start marketing product, without being saddled with an expensive dual-scan requirement. The interlaced option pleased broadcasters because it allows them to go digital in the near future and to upgrade to progressive scan later—when they are sure there is revenue to justify the expense and 60-frame scan receivers are robust. The IT

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The consumer electronics companies knew that it was movies that would drive the sale of DVD, so they were forced to address the film industry's concerns.

community, sure of the digital destiny, are convinced that broadcasters will eventually be driven to make their signals entirely computer-compatible and that the computer industry can beat out all the others in a competitive market anyway.

The Film Industry: The Datatroids Versus the Celluloids

[Computer industry leaders] were furious we hadn't brought them into the process [of setting DVD encryption standards]. They thought we had based our decisions on technology that was junk. In retrospect, we should have approached them sooner and when they did come on board, they made valuable contributions to the final encryption standards.

—Negotiator for a major motion picture studio

The DVD Controversy

Although it seems unlikely that bad feelings should exist between the IT and film industries, they have nevertheless arisen in the last two years. The precipitating factor was the development of the digital versatile disc (DVD) by two consortia of consumer electronics companies which, themselves, fought over competing standards for discs and players.

The motion picture industry didn't much care which set of standards was adopted for DVD, beyond an intense commitment to Dolby AC-3 audio as opposed to the European-adopted MPEG-2 audio standard. What interested the studios was protection of their material, and they shuddered at the thought of converting their expensive-to-produce proprietary material to an easily copied and transported digital format.

They informed the computer electronics manufacturers making the players that, if they didn't meet the needs of the film community, they would have to do without Hollywood motion pictures. The consumer electronics companies knew that it was movies that would drive the sale of DVD, just as it had been the lure to bring cable into so many TV households more than a

decade before, so they were forced to address the film industry's concerns.

A negotiator for one of the major studios says that the DVD encryption standards began as internal talks between one studio, Sony, and Matsushita which were designing the DVD for the consumer market. Then, the meetings were extended to include the rest of the motion picture industry and consumer electronics firms. In the middle of the negotiations, someone said, "Should we bring in the computer people because they are going to have something to say about this?"

"A consensus was developed (which few people will admit to having supported) that we were having enough trouble reaching an agreement among ourselves, so we decided to reach an agreement among ourselves first before involving others," describes the negotiator.

"So we proceeded down that road, reached an agreement, and showed it to the computer industry. They went a little berserk and said something to the effect of 'How could you go behind our backs and negotiate this massive legislation that affects our entire industry?' and they took tremendous offense at the bill. There were a lot of bad feelings and bruised egos over it," he recalls.

As it turned out, the IT technical people had valuable contributions to make to the process. What was most interesting is that one of the two greatest concerns to the computer interests was that "they were philosophically opposed to putting any technological standards into legislation. However, as major content providers, there are certain kinds of copying protections we need in the analog-to-digital environment, and the only way we know to get the anti-copying systems into place is to mandate the use of a specific system. If they can come up with a better approach, we'd listen. And that, at a general level, is the biggest controversy between us," this studio executive describes of the relative positions of the IT and film people.

The two sides still have not reached an agreement, although the decibel level has

lowered from shouts to conversational tones. A congenial working atmosphere has been restored, and it is likely an agreement will be reached on the standards for DVD encryption this year.

However, DVD was just the first battle in what could prove to be a much larger conflict. The dispute that started as essentially technical and cost issues opened up a grand canyon of opposition over intellectual property rights protection between the IT industry and the studios, producers, writers, and stars who create entertainment properties. Since that same issue concerned music copyright holders, and studios themselves counted as some owners of all, these troops were soon recruited to studios' cause.

Wipeout at WIPO

The collision between the IT and entertainment industries occurred in November 1996 at the World Intellectual Property Organization meeting in Geneva. The IT and on-line groups battled hard against the process of signing an international agreement before discussion in Congress, as well as some of the provisions in the WIPO treaty. Of particular concern to IT interests were what they believed to be severe restrictions on the fair use of material and the surveillance and enforcement of intellectual property rights that would violate the public's right to privacy. IT proponents simply did not believe that governments and private businesses should be able to track statements between private citizens.

WIPO was particularly interesting because of the way it cut across so many different interest groups.

- The computer hardware and software companies agreed to disagree on this one.
- Telephone companies were pitted against content providers, hardware, and software groups.
- Computer software and entertainment interests found themselves on the same side.

"The computer hardware industry has different interests than either the software

companies, including computer software and entertainment firms, and the telephone industry. The hardware and network people need a free flow of information; many software companies see the 'Net as a surveillance tool for unauthorized use; and the telephone companies want to be relieved of liability for the material that crosses their networks," explains James Love, speaking for the Taxpayer Assets Project and the Consumer Project on Technology at the Center for Study of Responsive Law.

In the area of intellectual property, the IT community has formed an organization to block the lobbying efforts of the motion picture industry. The Digital Future Coalition (DFC) is a 26-member Washington, D.C. group that was created to defeat the Infrastructure Copyright Act (S 1284 and HR 2441). When the WIPO conference was scheduled, this same group argued the computer industry positions against the content providers in Geneva.

The studios formed an alliance called the Creative Incentive Coalition that, in the eyes of the IT interests, promulgated extreme positions in favor of sweeping new intellectual property rights. "Their version of the treaty would mean that broad areas of technology, such as the VCR and the general purpose computer, could themselves be declared illegal. Then, too, it locked up public materials and databases so tight even Dun & Bradstreet and Bloomberg opposed these provisions," says Love.

In addition to the studios' actual comments, the IT representatives were amused and disgusted by the campaign Hollywood mounted to further their aims. From London, Madonna and Tom Hanks made statements on behalf of the studios' positions on the WIPO treaty. Most IT people thought these performers were manipulated by the studios into commenting on provisions they knew little about.

The IT/Studio Scorecard

Neither of the two conflicts between the computer community and the film studios is entirely resolved. The issue over DVD encryption to protect intellectual property

The dispute that started as essentially technical and cost issues opened up a grand canyon of opposition over intellectual property rights protection between the IT industry and the studios, producers, writers, and stars who create entertainment properties.

Hollywood got hosed in the Telecom Act of 1996.

against unauthorized copying is still under negotiation. However, IT interests were effective in improving the technology of the encryption process, and they have been invited by the studios to propose alternative enforcement procedures.

At the recent Geneva Conference of the World Intellectual Property Organization, computer people came away with most of the alterations to the proposed treaty they asked for. The provisions that would alter fair use were moderated, and rigid database protections were tabled for later consideration. Passages were deleted that would have considered the temporary computer storage of information during transmission (as on the World Wide Web) as an infringement of copyright. Technologies that could copy information weren't prohibited; rather, efforts would be made to keep technologies from being used for circumvention for unlawful purposes. Other language was softened to allow librarians to catalog and organize information. Finally, although network operators didn't win the specific exemption from liability for carrying copied material they were seeking, they did get language that said mere provision of facilities doesn't amount to communication.

These were important gains for the IT industry, as well as significant losses for the studios which were fierce proponents of all these protections. And the disappointment was a second legislative setback for the film industry. As James Love of the Taxpayer Assets Project noted, "Hollywood got hosed in the Telecommunications Act of 1996. It was weak on common carrier issues, such as open platforms and interoperability. They were very important for content providers to provide competition for delivery into the home. Without it, the money goes to the people who own the last mile."

The issues raised by the protection of intellectual property are difficult to resolve. Some creators want their material disseminated, such as activists trying to influence public opinion. Others want distribution only when compensated. And, still others want to restrict distribution sharply to maintain a high valuation. The computer

hardware faction made the slogan, "Information wants to be free," their watchword, but it is clear that this sentiment is not shared by content providers.

The Consumer Electronics Industry: If You Build It, They Will Complain

It's not easy making a mass market product out of a new digital technology. Especially when consumer electronics manufacturers just don't make products that meet the high standards of the computer folks—because dissatisfaction with current state-of-the-art is part and parcel of the IT belief system. Of all the disagreements the IT companies have with related industries, their arguments with the consumer electronics manufacturers stand out as very different. For one thing, unlike the other industries, IT hardware manufacturers are in direct retail competition with the CE companies.

The competition occurs because the computer hardware companies manufacture computers and other equipment themselves—owning their own facilities, and marketing and distributing them under each company's own brand name. As long as the computer was a complicated business product, they were of little concern to the CE industry. But, now that computers have entered the mass consumer market, CE manufacturers wonder if they have missed a significant opportunity.

"[A] clear definition of the computer and electronics industries may never be the same with personal computer manufacturers producing more consumer electronics-like products, and consumer electronics companies making personal computers. It's going to be a messy marketplace in the short-term future. And it's going to be a tough call predicting which products will emerge as the chosen computing device, especially when there are still over 60% of the U.S. population yet to purchase a computer," says a Jupiter Communications publication.³²

The uncertainty over whether the computer market is an opportunity stems from the low profit margin on standardized PC clones, the need for a specialized sales force, and the need for ongoing customer

support. For example, CE manufacturer and retailer Tandy successfully marketed the legendary TRS-80 (lovingly called by its users the Trash-80), but its later models lost their appeal because of their proprietary standards, high prices, and poor product support.

Aside from the street level conflict, the other differences dividing the IT forces from the CE companies stem from the design of products that flow from standards for emerging technologies: HDTV and DTV receivers and DVD players. In both cases, CE manufacturers sided against the IT interests because of the tradeoff between cost and quality.

Computer makers and CE companies bring a different set of operating principles to developing and marketing products. Both are innovative. But CE products are almost always aimed at the mass market, at mass market price points. By contrast, the computer market has long been dominated by technically savvy innovators and early adopters who value innovation for its own sake.

These early adopters don't mind customizing and upgrading their systems by putting in new cards, chips, and peripherals. They want standards so that products from different sources will interoperate, and they pay the higher prices it takes to buy new products early in the release cycle.

Mass market adopters demand a much greater level of standardization and interoperability. They want product packages that put together all the features they want with plug-and-play capability and transparent interoperability. They demand much lower prices before they will buy.³³

Two skirmishes have been fought between CE manufacturers and the IT industry over the "productization" of emerging technologies. In both cases, the issue was the cost/quality tradeoff, where the IT people insisted on higher quality technology that would market at too high a price point for the CE community to market effectively.

Take digital television receivers—DTV sets. The computer companies were determined that HDTV and DTV would be

computer-compatible. This demand first affected local TV stations since it called for the transmission of a digital, progressive-scan signal. When it looked like they would lose that battle, the IT industry wanted the manufacturers of TV sets to install an expensive chip to convert the interlaced format signal to appear on a progressive format display—like the computer monitor. The set makers flatly refused to take on that price handicap, and it took almost a year to reach agreement.

The other product was the digital versatile disc—the DVD. The CE companies sided with the film studios because sales of their players were utterly dependent on a favorable decision from movie makers to provide their content as a driver of consumer demand. As mentioned earlier, they came to an agreement with Hollywood—until the IT industry found out about it.

Thomas Polgar, vice president of government affairs for Viacom, describes how the computer companies forced the product manufacturers to change their designs: "The computer people responded by telling us that the technology we were basing the agreement on was poor. They were right. And, as a result, we've developed a better system for preventing copying, and that was a major contribution to the effort made by the computer people."

The IT/Consumer Electronics Scorecard

The scores of the consumer electronics industry and the computer companies will be settled in the marketplace through their competition over the sales of products to the consumer rather than in the halls of regulatory agencies. To the extent they have met there, their contact has been through their association with the TV interests and DTV and the film studios and DVD. In the sense that the consumer electronics companies were allied against the computer forces, they were required to adapt to the IT industry's gains.

From Conflict to Collaboration

This chapter in the history of communication policy and regulation could well be

In both cases, the issue was the cost/quality tradeoff, where the IT people insisted on higher quality technology that would market at too high a price point for the CE community to market effectively.

The IT industry is a David against Goliath, or a small guerrilla force launching surprise attacks against ponderous, indecisive giants who believed they were unassailable until their weaknesses were publicly exposed.

called the invasion of the infowarriors. From December 1995 until the present, it has been an extraordinary 14 months of activity as the IT industry takes its place vis-à-vis other industries. The year 1996 saw:

- Filings against LECs in six states.
- The final negotiations on digital television and HDTV.
- The scuttling of DVD encryption standards by the IT forces.
- Toe-to-toe jousting with the consumer electronics industry over the productization of DTV and DVD.

In these skirmishes, the IT industry is a David against Goliath, or a small guerrilla force launching surprise attacks against ponderous, indecisive giants who believed they were unassailable until their weaknesses were publicly exposed. It is rare for a computer company to have more than just a handful of people in Washington, and they are mostly concerned with international trade issues. To the extent IT staffs reach any size, it is because they are involved in product sales to the government, rather than lobbying.

As a practical matter, the telephone companies and the broadcasters have had a strong Washington presence for many years. The typical office for a Baby Bell is 20 to 30 people spending their time just on regulations. However, sheer numbers don't always carry the day.

Mark Jamison notes, "When you are dealing with a regulatory issue, certainly the telephone companies are more adept than the computer industry because they've been regulated for decades. But, it doesn't necessarily give them an advantage because it depends on how people view the different industries and which way the customers want to move. My guess is that customers want to move the way the computer industry wants to move and that that will work against the local telephone companies."

Nevertheless, the computer industry is a reluctant player in this environment. One IT lobbyist said that the computer companies have done a good job of making their

positions known on international issues. However, when it comes to opposing the LECs, they're wary. "We worry about incumbents in highly-regulated environments because they might pull us into an area where they have a competitive advantage because they have so much more experience dealing with regulators. There is a long history of the telephone companies using the regulatory environment to batter their competitors. So we think it's an arena to avoid," observed this expert.

In the past year, information companies organized their resources to achieve their aims in state and federal regulatory proceedings. They have enjoyed a remarkable series of skirmishes and partial victories. However, sooner or later, they must turn their attention toward working with the industries they now oppose.

There is a general consensus that each of these giant, powerful interest groups has an interest in working with the digital forces—that, indeed, digital communication is the future. Each of them relies on the innovation brought about by the IT industry's extraordinary commitment to research and development that none of the others can claim.

The telephone companies have the most to gain, although they appear distracted by their quixotic desires to act as media content producers. The growing use of the Internet has already brought them millions of dollars in profits from the many second lines that have been installed for 'Net access, and this business can only increase over time.

According to expert Mark Jamison, "Whether and when they will work together [LECs and IT industry] is a mixed bag. At some point, they will realize they have a lot in common. So, in the long run, they will find some way to get together. But there's no set timeframe. It depends on how long it takes for their corporate cultures to change enough to accommodate working together and the path that deregulation follows."

The broadcasters are in a somewhat more difficult position. The television networks are essentially programming services that rely on the affiliate system (and

their profitable owned-and-operated stations) for revenues. As programmers, they should be pleased that there is another distribution mechanism, which should raise the value of their much-watched offerings. However, as local station owners, they will compete against a broadband network that can deliver quality video and audio. Such a development is probably seven to 10 years away, but it casts a long shadow over the relationship between broadcasters and the IT industry.

Neal Friedman comments, "Right now, they've decided to make peace. We can hope it will last for a while. The more savvy broadcasters see that the system of delivery that's been in place over the last 50 years is going to change. I remember talking to one station engineer, 'Our transmitter will need to be replaced, and our owners have asked me to find out whether we should even buy one.' It was a provocative question then, and today it's an even more provocative one."

The computer hardware manufacturers and the studios disagree over intellectual property, and this conflict will probably continue for some time. However, the issue pushes a wedge between the IT hardware and software companies, with the software people siding more closely with the studios' position on the protection of intellectual property rights.

This dispute will probably be waged over a long period of time, in many different venues, between several interest groups—including publishers of books, magazines, and newspapers, video distributors, broadcasters, and others. However, there are no real difficulties between the IT and film industries.

Indeed, both sides have much to gain by close contact. The creative community that makes movies is a fascinated user of digital technology, and innovations reflected in their movies lead to consumer demand for the ability to make similar effects—spurring sales of computer equipment. Entertainment is also an important topic on on-line services.

The IT interests are also in a position to help the studios through their efforts to establish open network architecture and increased bandwidth to the home. The studios themselves have been slow to realize these changes would be beneficial to them, and they have not supported the IT community in those efforts.

Only the consumer electronics industry is in direct competition with the computer companies. While there may be competition in the marketplace, it is clear that the consumer electronics companies are among the chief beneficiaries of digital technologies. However, computer hardware companies could learn a great deal from their competition about brand building and marketing to the mass market consumer.

Conclusion

This story began as a small sidebar to an article I wrote for the *Los Angeles Times* on the problem of low bandwidth Internet access in March 1996. Then, I learned of the Intel filings against the LECs and spoke with then Intel attorney, Dhruv Khanna.

I realized that it was important but, as I explored the story and acquired more information over the year, I realized that it was just the beginning for a much larger fabric. It is the story of the birth of an interest group. Just as Robert Cringely characterized the entire industry as "accidental empires," so too is it an accidental interest group.

There is a likelihood that none of the participants in this round dance will emerge unchanged—even the IT industry. Computer companies bring a fresh exuberance for competition and innovation to American business, not just hypocritical sloganeering. And perhaps the now-genteel practitioners of big business will succeed in harnessing that energy to ride this magnificent opportunity into the winner's circle for a resurgence in U.S. international success.

The opposite is truly frightening: That big business should deaden the nerve and soaring ambition for excellence that drives the IT industry and take from it the narrow-

The creative community that makes movies is a fascinated user of digital technology, and innovations reflected in their movies lead to consumer demand for the ability to make similar effects—spurring sales of computer equipment.

minded genius-eat-retard competitive philosophy that permeates the IQ-rich information industries.

In the meantime, I don't know about you, but I want my Internet TV! nto

¹ "Hot Seat: Gates Gets on the 'Net," *InfoWorld*, Vol. 18, No. 12 (March 18, 1996).

² Andrew Grove, "The Big Issue," *Forbes ASAP* (December 2, 1996).

³ This chart was prepared by UUNet (derived from North River Venture "Black Hole in Cyberspace"). It appeared in *Telephony*, Vol. 231, No. 24 (December 9, 1996):36.

⁴ *InfoWorld* (August 27, 1996):14.

⁵ Federico Faggin, "The Future of the Microprocessor," *Forbes ASAP* (December 2, 1996).

⁶ Robert X. Cringely, *Accidental Empires* (Reading, MA: Addison-Wesley), p. 14.

⁷ Alan Cane, Analysys Publications, St. Giles Court, 24 Castle Street, Cambridge, U.K. (March 25, 1996).

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⁹ Frost & Sullivan, *World Multimedia Hardware and Software Markets* (1995).

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¹³ *Television Digest*, Vol. 36, No. 16 (April 15, 1996):17.

¹⁴ Cited in *Cablevision Blue Book* (1996), p. 34.

¹⁵ Cited in tele.com, *1996 Annual Report*, p. 58.

¹⁶ *Investor's Business Daily* (March 21, 1996):A8.

¹⁷ Telephone interview with Mary Hancock, Pacific Bell spokesperson.

¹⁸ "The 'Power' Trip: Computer Folks Are Being Nice to Cable to Get the Bells in Line," *Cablevision*, Vol. 20, No. 15 (February 19, 1996):36.

¹⁹ Cringely, *Accidental Empires*, pp. 189-190.

²⁰ Prepared testimony of Richard C. Hall, received from Intel Corporation (Santa Clara, California).

²¹ Complaint filed by *Compaq Computer Corporation and Intel Corporation v. Pacific Bell* (U-1001-C), Document No. C 96 02 002 (February 1, 1996).

²² Technology Industry Association's motion for late intervention, provisional approval, and leave to file late testimony, Before the New Mexico State Corporation Commission, Docket No. 95-769-TC (January 19, 1996).

²³ Motion to intervene of Intel Corporation, Before the State Office of Administrative Hearings, SOAH Docket No. 473-96-0116, PUC Docket No. 15024 (January 23, 1996).

²⁴ Intel Corporation's position statement in Docket No. 94-049-T20, Before the Public Service Commission of Utah (April 30, 1996).

²⁵ Motion for limited intervention and for continuance/deferral of U S WEST ISDN rate increase proposal, Before the Washington Utilities and Transportation Commission, Docket No. UT-950200 (December 28, 1995).

²⁶ Intel Corporation's position statement, Before the Public Service Commission of Utah, p. 25.

²⁷ Robert Rast, Vice President, Technical Business Development, General Instrument Corporation, quoted in *CED: Communications Engineering & Design* (April 1996).

²⁸ "Will Broadcasters, FCC Derail Digital TV?" *CED: Communications Engineering & Design* (March 1995).

²⁹ Craig Birkmaier, "The End of the Broadcast Era," *TV Broadcast* (October 1996):1, 70.

³⁰ Chris McConnell, "FCC Worries ATV Advocates," *Broadcasting & Cable*, Vol. 126, No. 16 (April 15, 1996):14.

³¹ "U.S. Ready to Launch HDTV Following Pact," *New Media Strategist*, Vol. 3 (December 6, 1996).

³² W. C. Liao, R. S. Rubin, and D. Coplin, "The Three Faces of PC/CE Convergence," *Interactive Home* (Jupiter Communications), pp. 5-7.

³³ Chris Halliwell, "The Role of Standards in Different Market Segments," *IEEE Proceedings on Computers* (1995).