

**Summary:** *The telecom industry has changed in ways not anticipated by the Telecom Act of 1996. A variety of innovative technologies such as voice over IP, e-mail, instant messaging, and wireless are commonly being substituted for traditional voice telephony, ensuring competition in the telecom sector and making prior methods of measuring competition obsolete.*



## “DON’T CALL—JUST SEND ME AN E-MAIL”: *The New Competition for Traditional Telecom*

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### INTRODUCTION

The telecom landscape has fundamentally changed since the days of the telephone line: new competition has arisen on all sides from new technologies and new providers. Even in the few years since the Telecom Act of 1996, unforeseen technologies are now commonly being substituted for traditional voice telephony. A variety of innovative technologies such as Voice over Internet Protocol, e-mail, instant messaging, and wireless are competing with traditional telecom providers. These technologies, ensuring an abundance of competition in the telecom sector today and into the future, make prior methods of measuring competition obsolete.

Traditional telecom providers are being squeezed by new companies and especially by new technologies that will change forever the way competition has been viewed in the telecom space. Worldwide, the number of main telephone lines (MTLs) increased by 33% in the first half of the 1990s, and by just 11% in the second half of the 1990s. In the United

States, MTLs grew from 1990 to 2000, but then the base began to shrink. MTLs in the U.S. are projected to continue to shrink by 1/2% to 2% per year over the 2001 to 2005 period.

The cause of the shrinking number of main telephone lines is clear when we compare the market penetration of alternative communication technologies to the penetration of telephone lines. According to a Plunkett Research study, for the year 2002, mobile cellular subscribers should hit 71% of the MTL penetration standard, personal computers 64%, and Internet usage 43%. By anyone’s standard, these numbers clearly demonstrate the competitive nature of communications globally. (See Tables 1 and 2)

The increased success of competitive local exchange carriers (CLECs) also demonstrates how fast the telecommunications sector is changing. One of the most compelling indicators of telecom competition is that, until December 1999, incumbent local exchange carriers (ILECs) experienced end line

**Table 1 GLOBAL TELECOMMUNICATIONS SERVICE INDICATORS**

(Figures in millions)

SERVICE	1990	1995	% GROWTH 90-'95	2000	% GROWTH 95-'00	2002	% GROWTH 00-'02
MAIN TELEPHONE LINES	520	690	33%	950	38%	1,050	11%
MOBILE CELLULAR SUBSCRIBERS	11	90	718%	500	456%	750	50%
PERSONAL COMPUTERS	120	220	67%	500	127%	670	34%
INTERNET USERS	2.6	33	1,169%	300	809%	450	50%

Source: Extracted from Plunkett Research, Ltd., Plunkett's Telecommunications Industry Almanac 2002, Page 7

**Table 2 CELLULAR, PC AND INTERNET USE AS A % OF MAIN TELEPHONE LINES (MTL)**

	1990	% MTL	1995	% MTL	2000	% MTL	2002	% MTL
MAIN TELEPHONE LINES (MTL)	520		690		950		1050	
MOBILE CELLULAR SUBSCRIBERS	11	2%	90	13%	500	53%	750	71%
PERSONAL COMPUTERS	120	23%	220	32%	500	53%	670	64%
INTERNET USERS	2.6	1%	33	5%	300	32%	450	43%

Source: Extracted from Plunkett Research, Ltd., Plunkett's Telecommunications Industry Almanac 2002, Page 7

growth. Beginning in the period from December 1999 to June of 2000 and continuing to December of 2000 that end line curve had turned downward.

When the U.S. Justice Department filed antitrust suits in 1974 against IBM ("the" computer company) and AT&T ("the" phone company), the separation between computer technology and telephone technology was considered wide. In the ensuing decades the two technologies have become intertwined in a way that no one would have expected at that time. Now the competition to the successors of the old Bell System is almost dwarfed by the aggregate competition.

### DSL vs. CABLE MODEM

Consumer use of Internet technology has largely been dictated in recent years by competitive services. Broadband services, which include DSL and cable modem, are far superior to traditional telephone line dial-up. (See Table 3) Plunkett Research suggests that while DSL is 13 times faster than conventional dial-up, cable modem is almost 17 times faster than conventional dial-up.]

Broadband technology has introduced more competition: non-ILEC lines command 61.4% of the total high-speed lines deployed compared to 38.6% penetration for RBOC (regional Bell Operating company) and other ILEC carriers. Furthermore, while comparing cable and DSL technologies, we should point out that the two technologies are regulated very differently, giving cable a distinct regulatory advantage. Almost certainly the regulatory advantage has contributed to higher availability and a faster rollout of cable broadband services.

Residential pricing in broadband services has continuously dropped over the past several years and is expected to follow its downward slope in the foreseeable future. The 1996 average price for residential broadband according to NxGen Data Research stood at \$80.00, which tumbled to an average price of \$52.50 in 2000. It is estimated that by the end of 2002 it will come down to \$42.50.

The DSL vs. cable modem competition is not, in any case, the final word on broadband Internet access. Already being developed and implemented is a technology that could far

**Table 3 HIGH-SPEED LINE GROWTH, DECEMBER 1999 TO DECEMBER 2000**

TYPES OF TECHNOLOGY	DEC-1999	JUN-2000	DEC-2000	JUNE 2001	% CHANGE	
					JUN 2000-DEC 2000	DEC 2000-JUN 2001
ADSL	369,792	951,583	1,977,377	2,693,834	108%	36%
OTHER WIRELINE	609,909	764,099	1,063,563	1,088,066	35%	7%
COAXIAL CABLE	1,414,183	2,284,491	3,576,378	5,184,141	57%	45%
FIBER	312,204	307,151	376,506	455,593	22%	21%
SATELLITE & FIXED WIRELESS	50,404	65,615	112,405	194,707	71%	73%
TOTAL LINES	2,756,492	4,372,939	7,106,229	9,616,341	62%	36%

Source: High-Speed Services for Internet Access: Subscribership as of December 31, 2000, Industry Analysis Division, Common Carrier Bureau, Federal Communications Commission, August 2001

surpass the performance of either. Fiber-optic technologies are now mostly used by businesses because they are still an expensive service. But the benefits are great: much faster Internet service and more adaptability to the changing needs of a company.

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## VOICE OVER INTERNET PROTOCOL (VoIP)

Internet service providers (ISPs) and CLECs are capitalizing on another highly competitive technology that challenges traditional telephony. Voice over Internet Protocol (VoIP) is an efficient and inexpensive way to communicate by voice through a computer connection. Savings accrue using IP instead of conventional long distance service. For personal use, a number of free services are available and teleworkers can save the company money, especially with overseas calls. IP systems can reduce operating expenses by offering lower costs for maintenance, facilities, upgrades and equipment.

Christopher Mines of Forrester Research suggests that VoIP “. . . is a classic disruptive technology: a low-price, low-quality substitute for traditional service.” During 2000, Forrester Research found that 17% of 16–22 year olds were using Voice over Internet calls, and an even higher percentage of 13–15 year olds were doing so. An astounding 15% of online consumers now use their PCs for calls.

Many of the former dominant voice carriers appear to be fleeing their traditional haunts while new voice technologies and services, sparked by the ever-increasing ubiquity and reliability of IP networks, are about to catch fire. Significantly, these technologies are not only available to large corporations—they are available to small businesses and even consumers through Microsoft’s Windows XP—a surprisingly sophisticated communications platform now widely available and easily affordable. IP telephony is built right into the XP platform.

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## E-MAIL

E-mail is the most mature of the trio (E-mail, VoIP and IM) of new applications that compete directly with conventional voice services. E-mail is used both as a voice call substitute and a postal mail substitute, since it shares attributes with both. Particularly for businesses, e-mail is an important communications tool that occupies a significant part of the day. “Business users spend an average of 49 minutes every day managing their e-mail, and receive an average of 22 e-mail messages every day. . . 53 percent of those polled checked their e-mail at least six times a day when they were in the office, while 34 percent admitted to checking it constantly.”

A Pew Internet Study reported, “Internet users also said they are e-mailing family members more, with 84% of respondents using the technology to keep in touch with relatives.” According to the Yankee Group, 93% of households primarily access

e-mail services. The added e-mail use is probably both a substitute for phone calls and a supplement to family communications.

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## INSTANT MESSAGING

According to *The Wall Street Journal*, corporate America is discovering the power of instant messaging (IM), a web-based communication technology with the speed of voice telephony and the convenience of e-mail. Over the past few years, tech-savvy workers have quietly brought IM into the work place. They have found that IM allows them to collaborate more efficiently with colleagues. Like e-mail before it, IM has the potential to reshape how workers communicate and share knowledge.

In two polls, by Forrester Research and the Yankee Group, Instant Messaging shows penetration of about 50%. But of more interest is that while 96% of those who use IM use it at home, the number of those who use it at the office is up to 20%. Furthermore, of those who are using it professionally, 39% say they believe it improves productivity. Dramatically, about half (49%) of professional users say that IM replaces the telephone! IM has the benefit of being an e-mail replacement for 35% of the respondents.

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## WIRELESS

Plunkett Research reported that cellular phone penetration could reach 80% in the United States by 2005. Combine that with increased general service revenues and a declining price, and some other factors become clear. Plunkett cites research conducted by Peter D. Hart Associates, Inc., which found that 38% of American consumers have some interest in replacing their home phones with wireless phones. We are not talking here about second phone line replacement but actual service replacement.

Selection of wireless as their primary telecommunications service is fast becoming the preference in many third world countries. The less extensive infrastructure requirements for cellular are far more appealing in countries where wireline facilities are unavailable or under-available. It is much quicker and much easier to install cellular services than to develop a traditional local exchange infrastructure.

A Morgan Stanley report sums up the competitive forecast: “We believe the major driver of the decline will be the residential market, where substitution to wireless and other technologies is having a major impact on the industry. At AT&T, for example, average minutes of wireline use per subscriber are currently declining at a rate of 10% year-over-year.”

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## NEW COMPETITORS

We have already mentioned that Microsoft’s latest operating system—Windows XP—is an impressive communications platform with VoIP technology built-in. In addition,

AOLTimeWarner is already a player in communications with its AOL By Phone and AOL Instant Messaging products. Interestingly, Microsoft has opened its Passport services up to users of AOL. The entrance of these and other companies into the telecom market is yet another indication of the vitality and increasing competition that challenges traditional providers.

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## TELEPRESENCE

When discussing these new communications technologies, it is hard to resist a brief peek into the future of what will be available when these technologies merge and even higher bandwidth is available to the majority of homes and businesses. Though too small a factor for today's regulatory consideration, telepresence (sometimes called virtual reality) is the ability to view anything almost anywhere in the world and to remotely control a camera over the Internet using nothing more than a standard Web browser.

The opportunities for use of this technology is virtually unlimited, from telemedicine to monitoring construction sites. In medicine, telepresence could be highly useful in surgery. As SRI International, Inc. described in a 2002 paper, by combining the proper technologies it could create a new method of surgery—telepresence surgery—that offers the patient minimally invasive surgery (MIS) without compromising the surgeon's skills. Telepresence is also being experimented with for monitoring hazardous materials rooms, dangerous chemical sites, and even weather developments.

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## IMPLICATIONS FOR PUBLIC POLICY

The fact that these new technologies are growing rapidly and are substituting for conventional voice calls suggests that the traditional method of measuring "competition in voice services" should be expanded to include these new services. Wireline carriers are losing in both number of lines and number of minutes to these new technologies. In March of this year, the Yankee Group predicted that between 2002 and 2003, wireline carriers would lose 15 billion consumer long distance minutes, and that residential long distance minutes would decline by about 10% per year for the next five years.

These new technologies represent new forms of competition for traditional providers of both local and long-distance services.

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## CONCLUSION

By now policy makers are familiar with the pattern of technologies developing faster than government regulations can keep pace. Perhaps the latest and greatest example is the Telecom Act of 1996, which failed to anticipate the direction of telecom development. One key unanticipated change was the degree to which new communications technologies have become major competition for traditional phone services. Despite the notable failure of several new communications companies and the overall slump in the technology sector, competition in communications is alive, well, and growing. As policy makers consider pending and future telecom legislation, they would do well to throw out their old ideas about measuring competition, and consider the strong acceptance by consumers of new and expanding forms of communication made available by the digital revolution.

The new competitive media of instant messaging, voice over Internet protocol (VoIP), cable broadband, and telepresence suggest that the technological advance of new interactive communications media is *now*, is *big* and is sweeping aside traditional technologies. Together with cellular and PCS wireless services the new environment today is heavy with competitive offerings. If the experience of the past five to ten years is instructive it tells us that technology and its deployment will continue to grow by almost geometric proportions—and the competition will expand even more aggressively.

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