
Trends in Communications and Other Musings on Our Future

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The Changing World of Communications

For sixty years, that stalwart document, the Communications Act of 1934 (Act), has governed federal regulation of all interstate and foreign communication by wire and radio, including telephone, telegraph, broadcasting, and satellites. The Act also established the Federal Communications Commission (FCC or Commission) in order to consolidate regulatory authority which had previously been spread among several agencies. [\(note 1\)](#)

In 1934, the world of communications was vastly different than our high-tech world of today. Sixty years ago, almost all wire line telephone and telegraph systems were operated by the American Telephone & Telegraph Company, now AT&T. Radio was the dominant broadcast medium. Station owners included the National Broadcasting Company (NBC), a subsidiary of the Radio Corporation of America (RCA), which operated a commercial radio network of twenty-four radio stations. Television was still in experimental stages; it would not be until 1941 that the FCC would authorize commercial television operation on ten commercial stations.

Congressional members in 1934 could hardly have imagined the vast changes in communications technology that have occurred in the last sixty years. A variety of examples show how far we have come.

From the centralized telephone network of AT&T that existed in the 1930s, the breakup of AT&T in 1984 has completely changed the landline telephone landscape. Monopolies have given way to competition in most markets previously dominated by the Bell System. Landline telephones now reach 93.4 percent of all American households, [\(note 2\)](#) nearly realizing the Act's goal of universal service.

In 1934, "birds" referred to winged avaries. In 1962, a communications satellite named Telstar I relayed the first live transatlantic telecast. Now, an estimated seventy communications satellites, or "birds," orbit the Earth, providing vital links for a wide range of communications needs, ranging from data transmissions to the sending of video images for a television newscast. Last year, Teledesic Corporation [\(note 3\)](#) proposed a global network of 840 low-earth-orbit communications satellites. Such a network would provide a global telephone system reaching even the remotest village in Africa or Siberia.

Video conferencing, as launched by AT&T's "Picturephone" at the 1964 World's Fair in Flushing, New York, is now a reality, reducing travel costs for users, especially businesses.

Optical fiber for long-range communications, developed in 1970, has revolutionized the speed and capacity of data that can flow across a line.

In 1990, General Instruments announced the development of a way to compress and transmit high quality video images digitally. This revolutionary breakthrough will allow all forms of information-data, video, or sound-to flow over telephone, television, and computer lines.

The last three decades have brought us wireless telephones and paging services which have untethered people from wired landline telephones. An increasingly mobile society of Americans has embraced wireless communications with enthusiasm. Furthermore, the rise of the personal computer since the mid-seventies has revolutionized the workplace.

These developments have changed how people communicate and have dramatically affected our lifestyles.

Back to the Future

Like Congress members in 1934 trying to envision what communications technology would become in 1994, it is nearly impossible for us to envision what the world of telecommunications will look like sixty years hence-in the year 2054. Nonetheless, we must make policy choices today that will affect that future world. We find ourselves at an important crossroads facing an unprecedented convergence of the telecommunications, cable, computer, entertainment, broadcasting, and publishing industries.

Visionaries generally describe the future to be a multimedia world of seamless, two-way video, voice and data connections that will allow people to communicate on a new, more advanced level. Current technologies such as the television, computer, and telephone are expected to merge into an extraordinary whole. "Teleputers" are envisioned that will combine the functions of a networked personal computer and a television entertainment device.[\(note 4\)](#)

Due to these tremendous advances, policymakers can no longer regulate these industries in isolation but must take a broader perspective which takes this convergence into account. To chart a course for the next sixty years of communications, it is helpful to identify current trends and technological developments, and then to consider this information when forming new regulatory policies to encourage the vibrant growth of the communications industry.

Convergence

Convergence of technologies is a dominant theme in today's telecommunications world. Advances in technology-such as fiber optics and digital technology-have allowed many players in the communications industry to use their current systems for the provision of a new type of product-broadband services. A tremendous amount of capital and expertise is required to build these upgraded or new systems. Companies are assessing their ability to play in the multimedia world of tomorrow, and are seeking partners to enhance their ability to stay competitive.

This notion of convergence is driving telecommunications companies to enter strategic alliances that were unheard of in prior decades. For example, telephone companies are upgrading their coaxial lines to provide video programming. Cable systems are seeking to provide telephone or data services via their existing cable infrastructure into the home. Satellite systems are already offering video and audio programming which compete with cable TV systems and over-the-air broadcasters. All are jockeying for the best position in what they see as the multimedia world of tomorrow.

Competition

Movement towards competitive markets is another theme. Over the past twenty years, the trend has been to introduce competition to all communications sectors previously reserved for monopolies. Still left is the local telephone loop and, in many areas, the local distribution level of cable television. Efforts are already underway, however, to introduce competition in both areas.

Mobile Communications Services

A third trend is the tremendous demand that Americans have for ubiquitous, wide-area mobile communications services. The explosive growth of the wireless industry has demonstrated the public's desire for these mobile units. Moreover, these handy devices have profoundly impacted how people communicate with each other. With the advent of the new personal communications services (PCS) industry, mobile communications will continue to flourish as increased competition drives rates down, and wireless data services and pocket-sized portable phones become commonplace.

Personal Computers

Equally making its mark is the phenomenal rise in popularity of the personal computer (PC) in American homes. As PC prices continue to fall, more and more Americans are buying computers. They use them to play games, to work at home, or access the Internet or commercial online services such as CompuServe, Prodigy, or America Online.

The unregulated, freewheeling environment of the Internet has encouraged its tremendous growth, as thousands of Americans log on each day to explore the tremendous amount of information available through the Internet. [\(note 5\)](#) The promise of the information superhighway is especially tantalizing to many computer users who hope their computer will be the gateway to deep fountains of knowledge and new forms of entertainment, such as participation in interactive forums or games.

Video Entertainment

Another trend is the transformation of video entertainment from the three television network scenario of the past. Video programming now has many distribution avenues, including television broadcast stations, cable systems, and satellite direct broadcast systems. In trials, video programmers are already offering programming on the video dialtone systems of telephone companies. Future entertainment is expected to consist of interactive video entertainment and programming incorporating virtual reality technology.

As a result, content is increasingly seen as the key commodity of the Information Age. After all, who cares if we have 500-channel video systems unless there are programs worth watching on them? The growth of video channels with innovative and fresh programming is an important trend. New program channels oriented towards niche markets, for example, children's shows or women's sports, will offer interesting new fare.

Many companies have seen the potential inherent in this market. Even companies formerly oriented only towards common carriage, like Comsat, are developing entertainment and sports programming subsidiaries and taking ownership of sports teams. It is not a coincidence that studios and networks are greatly prized acquisitions in the frenzy of mergers as companies fight to enter strategic alliances.

A final aspect of the transformation of video entertainment can be seen in the new competition among service providers for advertising revenue. Advertising revenue is being redistributed as new entrants fiercely compete with the formerly dominant television networks. National cable channels and direct broadcast satellite systems, for example, are able to find niche audiences nationally where none existed in a local or even regional service area.

Musings on the Future

Given these trends, we must be forward-looking in our regulations and policies. We first must have the courage to discard outdated regulations and policies in a nonpartisan manner. This is no longer a world in which broadcasting, cable, and telephone operations are distinct businesses separate from one another. Yet, the Communications Act regulates each industry separately based upon historical differences. Different parts of the statute regulate cable companies, telephone companies, broadcasters, and satellite service providers in isolation.

These differences in regulatory treatment create artificial barriers to competition. Competition must be introduced as quickly as possible in all markets, and these artificial barriers swept away as we continue to deregulate. There should be frank discussion of the scope and need for regulation that will be appropriate in these new competitive markets. This process may be accelerated by sweeping telecommunications legislation, if Congress, the affected industries, and other interested parties, including consumer groups, can reach consensus as to the contents of such regulation.

We must encourage simple, pragmatic regulations. By "simple" regulations, I mean a process by which the goal of regulation is clearly identified and then the most streamlined, nonburdensome method of regulation is crafted to reach that goal. Too often, government regulation is incomprehensible to laypersons, and overburdensome on licensees who have businesses to operate. By "pragmatic" regulation, I mean injecting practical business and economic considerations when designing regulations.

Flexible regulatory frameworks are also necessary. By "flexible," I mean building into our regulations some flexibility in recognition of the rapid pace of technology in telecommunications. We cannot afford to focus our gaze on the current state of technology. We must gear our regulation to the principles of open access and competitive entry. In that way, we can spur innovation instead of stifle it by our regulations.

We must also recognize the global nature of the communications infrastructure. Regulators cannot restrict their view to solely domestic issues. We must carefully listen to views from other countries and share our experiences and ideas. The United States is a world leader in telecommunications. To maintain our leadership role, we must understand the needs of other countries as well as our own.

Around the world, people are beginning to realize the possibilities inherent in a Global Information Infrastructure, or "GII" as we are calling it in this country. Entrepreneurs are beginning to appreciate the value of global information networks. The integration of the computer and far-flung digital networks will bring enhanced productivity and help make companies more adaptable to changing market conditions. For developing nations, the information network will be an invaluable resource to aid in developing their economies, infrastructure, and political institutions. The GII will lead to advancements in education, health care, and other fields that will directly benefit those involved. We hope that governments and telecommunications companies around the world will support this initiative and work together to make it a reality.

In sum, we stand at the threshold of a new era in communications. As policymakers, we must consider not only the immediate impact of our actions but also look to the future effect. In the world of converging technologies, we must make sustained efforts to adopt good decisions that will usher us into the next phase of the Information Age.

Notes

Commissioner, Federal Communications Commission. The Author has been serving as a Commissioner since May 1994, and is the first Asian-American to serve as a member of the Federal Communications Commission. B.A. (political science and journalism) University of California-Berkeley, 1981; J.D. Hastings College of Law, 1984.

1. Agencies with jurisdiction over the airwaves prior to 1934 included the Federal Radio Commission, the Interstate Commerce Commission, the Post Office Department, the State Department, and the Department of Commerce. [Return to text](#)
2. United States Telephone Association, 1993 Phone Facts 3 (reporting the November 1992 statistics provided by the FCC Industry Analysis Division, Common Carrier Bureau) (copy on file with Author). [Return to text](#)
3. Teledesic Corporation has as its two most prominent investors Bill Gates and Craig McCaw. [Return to text](#)
4. See George Gilder, Life After Television 32 (1990). Gilder, a futurist, envisions "teleputers" as personal computers adapted for video processing and connected by fiber-optic threads to other "teleputers" all around the world. *Id.* [Return to text](#)
5. News reports vary on how many people log on daily to the Internet. One news story reports that the Internet has 25 million users and is estimated to be doubling each year. See Peter H. Lewis, *Internet for Profit*, Computer Shopper, Nov. 1994, at 178. The Executive Director of the Internet Society, Mr. A. M. Rutkowski, estimated that the Internet appears to be adding new users at the rate of 750,000 per month. He estimated the number of users now on the Internet to be between 25 and 30 million. *Latest Estimates of Internet Growth*, Online Newsletter, Nov. 1994, available in LEXIS, News Library, Nwsltr File. [Return to text](#)