

# MIDCONTINENT PERSPECTIVES

[Midwest Research Institute](#)

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## **Computer/Communications Outlook 1984**

This will take the form of a progress report on a presentation that my colleague Mr. Robert H. Gaynor, Vice President-Midwestern Region of AT&T Long Lines, made back in 1977. Bob gave an excellent dissertation on communications in the year 2001. That is a turning point in civilization and the focal point of the early lectures in this series.

One of the many significant contributions that Charlie Kimball made while he was chief executive officer of this institution was to establish the Midcontinent Perspectives Series. Charlie encouraged all of us to look out 20 to 25 years to visualize what the political and economic environment is going to be for business and industry, for agribusiness, and for energy at the turn of the century. The lecture series has contributed a great deal to the planning process in the midcontinent region, just as MRI, itself, has contributed a great deal to the midcontinent region.

Let me first provide a brief background of the company I represent. United Telecom has been billed by some as a "country telephone company." That, indeed, is what we were for many years. The company started back in 1896 in Abilene, Kansas, when Cleyson L. Brown rigged up a waterwheel on the Smoky Hill River and began to generate electricity. Brown was a real entrepreneur. He built the company up to national status by the early 30's. However, he built it so rapidly and with such a high degree of leverage that the company failed to survive the Great Depression. It went through bankruptcy and emerged as a very small utility company with telephone and power interests scattered in eight states. That company has now grown to where it is a respected member of the telephone industry and is rapidly gaining recognition in other industries. United Telecom is rapidly becoming a leader in providing remote computer services and in distributing telecommunications equipment and supplies.

The telephone industry is a unique industry. Almost everyone says that about their particular industry, but it is highly unusual when one company – AT&T – has 85% market share. IBM approaches this heady market share in the computer main frame business, but does not have a major stake in the market for computer services. The computer services market is now larger and is growing faster than the main frame market. General Telephone & Electronics is also a corporate giant, with \$10 billion in annual revenues. United is number three in the telephone industry. This year we will have about \$1.8 billion in revenues and sales. The telephone industry generates approximately \$56 billion in annual revenues. Almost 94% of these revenues are generated by Bell, General, and United. Still, there are some 1,400 other companies in the industry rendering telephone service in various parts of the country.

Ours is a highly concentrated industry. It's both capital- and labor-intensive. United Telecom has more than \$4 billion invested in plant and equipment. With \$1.8 billion in annual revenues, that means about \$2.30 is invested for each \$1.00 of annual revenue. The manufacturing business is quite different. A typical manufacturer will generate \$4.00 to \$5.00 in annual sales for each \$1.00 of investment in plant and equipment. That contrast attests to the capital-intensive nature of the telephone business. Telephony is also labor-intensive: About one-third of revenues are expended on payroll. Being both capital- and labor-intensive, we are very concerned about productivity of both capital and labor.

Still, this industry has grown in recent times at roughly twice the rate of the gross national product and of the private economy as a whole. In the last twenty years the telephone industry has accounted for 10% of all the investment in equipment and plants, 1% of the total U.S. employment, and about 2% of the total GNP.

One should really consider telephone companies as a part of the information technology business, that is, the gathering, preparation, storage, transmission, and use of information. This broadly defined information technology business represents about 45% of our total GNP. That is a big segment of our economy. It's growing very rapidly and changing dramatically.

You may be interested in a couple of other statistics which tell something about our industry. Twenty percent of all the corporate debt outstanding is issued by telephone companies. Four and one-half million common equity shareholders own telephone company stocks. On a weighted basis, the industry represents 5% of the Dow Jones industrial average and 7% of the Standard & Poor's 500 index.

But let's come closer to home, both in terms of time and in terms of serving the rural and suburban areas which characterize the midcontinent region. Kansas City is not usually recognized as a communications center, even though communications companies represent a very large part of the regional economy. The regional operating headquarters of AT&T, the divisional headquarters of Southwestern Bell, several major Western Electric plants, and the corporate headquarters of King Radio and United have made communications a very important part of our local economy. I daresay, we will be an even larger part of the local economy as these and other telecommunications companies begin to serve the computer/communications industry. The area's economy will be more dependent on the growth and development of these telecommunications interests.

There is a great deal of consternation in our industry today. Bob Gaynor alluded to our problem in 1977. At that time, the bill which became the Communications Reform Act of 1976 had been introduced in Congress. That Act was successful only in helping to define the problem. We have been struggling ever since to obtain a legislative mandate which would establish a national telecommunications policy for this country. To those of you who have not been close to our industry, this professed consternation may come as something of a surprise. Here we have the best telephone system in the world providing service at one of the lowest percentages of average spendable income. It is investor-owned, in contrast with most other countries where practically all telecommunication services are provided by the government. The United States telephone industry has progressed to this satisfactory state under regulation as conceived and mandated by the Communications Act of 1934.

The industry has moved forward technologically and continues to provide good service at a reasonable cost. Now we say that the industry is in a chaotic state. What went wrong? Well,

nothing went wrong. That's the problem, everything went too well. Thanks to Bell Labs and others, new technologies have been introduced at a very rapid pace. The transistor was invented in 1947. Since that time, the industry has advanced into large-scale integrated circuits and microprocessors. A microprocessor about as large as the tip of your little finger can replace the computing power of the first commercial computer, which would fill this auditorium with hardware. That's one measure of what has happened in the electronics industry in the last 30 years.

This advancing technology has driven down costs. It has made other services feasible and, in an industry where one participant has an 85% market share, it is attracting a lot of companies that want a piece of the action. These are not fly-by-night companies, nor are they small, emerging companies. Such well known and highly regarded companies as IBM, ITT, Xerox, Southern Pacific, and RCA are joining the fray. There is no question that they can contribute to the growth and development of the industry. There is a question of how they should enter the industry.

The telephone industry has historically been a regulated monopoly. United doesn't compete with AT&T. We have franchised service areas, providing monopoly telephone service within those areas, and we interconnect with AT&T and other companies. When you make long distance telephone calls, you don't know whose facilities you're using and you don't really care. You simply get a bill from your local serving telephone company. While one would have to make a few apologies for the service rendered by some of the smaller companies in days past, one can now say that the quality of service is uniformly good.

There is no question that the American public is in favor of a competitive marketplace. We heartily endorse that sentiment. We have been actively working to introduce competition into our business, a position not always understood or appreciated by some of our peers in the industry. I firmly believe that we should have and will have widespread competition in the industry ten years hence. Getting from here to there is going to be a difficult transition. That's what all the rhetoric is about and that's what the legislation is intended to address. We are regulated at the national level by the Federal Communications Commission. We are regulated at the state level by such bodies as the Missouri Public Service Commission.

As in most regulated industries, politics enter the picture. I don't mean "politics" to be a denigrating term across the board because there are some very competent politicians and there are some very competent regulators. What they are trying to do is basically correct. They are trying to introduce competition in the telephone industry and trying to improve competition in the computer industry. These industries generate combined revenues of about \$125 billion a year. Revenues are growing at a rate of 20% to 25% per year. We're trying to move from a regulated monopoly to an unregulated, competitive marketplace. At the moment, we have regulated competition – the worst of both worlds. Still, we're making progress and that's really all we can ask.

What is going to happen, I'm convinced, is that we will see a fully competitive marketplace within a decade. The corporate giants of the world will be fighting for a market share in what promises to be a very exciting and attractive marketplace-computer/communications.

The first real test of our technical and marketing abilities will be to take computer and telephone technology and harness it for the benefit of the business and professional office. Over

the last ten years, the productivity of the factory worker has gone up about 83%. In those same ten years, the productivity of the office worker has gone up only 4%. You all know, and probably utilize, the time-honored practice of dictation with a secretary typing the letter after it has been drafted a couple of times and you have done some editing. I haven't seen recent figures on the cost of the dictation-typing process, but it's got to be in the neighborhood of \$10 a letter. The Postal Service says that by 1985 the first class stamp will cost between 25¢ and 35¢. Xerox claims that current facsimile machines can transmit within a matter of seconds an 8.5" x 11" page of paper for 4¢ a page. IBM asserts that its new satellite business system can do the same job in a matter of seconds for only 3¢.

You may not realize that only 28% of all business calls are completed to the intended person on the first attempt. We in the telephone business don't talk about that a great deal since it represents a horrible waste of time and effort. We could solve that problem by sending hard copy, instantly, to the desk of somebody you want to communicate with – after you've tried your call, of course. If you don't find your party in or available to talk, hit another button and have the hard copy transmitted. We're working on it!

One wonders why in the world American business has tolerated this level of productivity in the white collar sector while it fights continually for productivity gains for factory and service employees. I suspect it's probably because those of us who call ourselves managers never thought it very appropriate for us to learn how to use a typewriter or a cathode ray tube so that we could correct correspondence, speech drafts, and other hard copy material instead of asking secretaries or assistants to do so. For the kind of money we're talking about – between \$4 billion and \$5 billion a year in waste and inefficiency in the office – it's time that we as managers start setting an example.

Consider the farm worker. The typical investment behind his productivity gains is about \$75,000. Some \$25,000 currently is invested in the work tools of the average factory worker which he or she can apply to productive efforts. The investment supporting an office worker is somewhere between \$2,000 and \$3,000. A desk, a chair, a typewriter, some filing cabinets – that's about the extent of it. And office workers comprise almost 50% of our work force!

Is it any wonder that the productivity of this country fell 2.5% in the first half of 1979? If we would put the kind of investment behind an office worker that we put behind a factory worker, we would generate a tremendous market—something like \$1.25 trillion! Equipping the office worker with the same kind of tools or the same kind of productive capacity that we put behind every factory worker will happen in the next decade. What will emerge is the so-called "office of the future." Productivity gains will make it prudent to do so. It is going to revolutionize the way we do business, the way we communicate with our branch offices and our other business associates. We will be using a typewriter keyboard or reading information displayed on a cathode ray tube instead of dictating and typing those letters and mailing them out in neat little envelopes, wondering if they ever will be delivered!

Telecommunications has made a great contribution to quality of life in America, as well as to the general economy. We now are on the threshold of advances which will have significant impact on the nation and on the midcontinent region. These advances will come about by a combination of the technologies which are developing in both the computer and telecommunications industries. It promises to be a very exciting business, one which will grow at rates at least twice those of the general economy. New technologies will impact both the

electronic and print media. Technology and economics will change the way we do business. Properly applied, computer/communications can do much to improve productivity in the office and the factory, while providing services to the home which will do much to improve the quality of life.

An editorial in the *Kansas City Times* on Thanksgiving morning said that the 1980's are not shaping up as a decade of promise; that, quite the contrary, this will be a frightening decade of costly shortages in food, energy, housing, health care, and natural resources. The editorial strongly advocates the use of self-control to safeguard the political and economic systems that made such abundance possible in past decades.

We can be thankful that we have the technological tools which may offer the best chance to find the solution for the unforeseen problems ahead. As the editorial concluded, "Let's resolve to attempt to be wise, generous where possible, prudent where necessary, and always open to change."

## QUESTIONS AND ANSWERS

**QUESTION:** I have read about cable TV and the implications of that new technology. The experts are talking about using satellites to bounce signals to a little black box on your TV set. That raises tremendous possibilities, including a home computer. What is the latest on that from United's point of view?

**ANSWER:** It is true that direct satellite-to-home transmissions are now technologically feasible and may soon be economically feasible. The major constraint is programming. How many old movies or obscure sporting events do you want to see?

However, great strides are being made in the "software" or programming aspects of cable TV. The QUBE system in Columbus, Ohio, is a case in point. Warner Communications and other such companies are experimenting with some very innovative two-way services using regular coaxial cable. While present costs are high, there's little doubt that two-way video systems are just around the corner.

Direct home merchandising is a good example. The stores in Columbus, Ohio, are showing the housewife what styles they have in the ladies ready-to-wear department. Via a push-button telephone, the housewife can order a dress, have it delivered, and be billed for it. This is just the beginning.

The prevailing transmission facility at the moment is land lines. The cost of satellite ground stations and receivers is coming down. Whether satellite transmissions to the home will ever be operationally feasible remains to be seen. The costs of fiber optics and broadband transmission systems are coming down rapidly. It is anticipated that a single facility to the home and office will eventually provide all communications services – telephone, alarm, remote metering, energy control, educational or entertainment video, polling services, direct merchandising, library retrieval – you name it. Any kind of information you want in your home or office can ultimately be provided over a single facility at a low incremental cost.

Over the next three to five years, most of these services will be market-tested. By the mid-1980's, I expect the cost of fiber optics and the associated electronics will be reduced to the point that we will start to see the emergence of the "wired city" concept. Every home and office

will have a communications console. If you want to have a home computer terminal, it can be equipped to communicate with other computers or respond to external directions via your communications console. You can do all of your accounting and control functions via a communications-linked computer. These ideas aren't just pie in the sky. The technology is here now. It's simply a matter of market acceptance and declining costs with mass production and utilization.

QUESTION: What form is the foreign competition going to take?

ANSWER: Foreign competitors are coming into the marketplace very actively. At the moment, "Japan, Inc." is providing equipment for the business user and setting up domestic plants to at least assemble, if not manufacture, components. I expect Western Europe to come in very strongly. I think we are going to see more and more foreign competition in the American marketplace. The United States is still the largest communications marketplace in the world. Competition from foreign suppliers is going to become more intense in telephone, electronic, and computer hardware.

QUESTION: Would you comment on what will happen to the lines themselves. Would AT&T, for example, keep whatever line franchise it has territorially?

ANSWER: In the local exchange area, like Kansas City, which is served by Southwestern Bell, I don't see effective competition for a long time, perhaps 20 years or more. There will be limited competition from cable TV operators, alarm signal operators, and others who will offer special services in addition to their basic services. I doubt that the local serving franchise will be disturbed for some time. It is in the public's interest to continue regulated monopoly services in this area. But the rest of the market is going to be up for grabs.

The terminal equipment portion of the market already is competitive. As a business person, you can buy custom-designed or standard equipment from any of a half a hundred competitors, both foreign and domestic. Competition is present in the intercity communications marketplace, competing with the telephone industry's long distance and WATS services. These competitors are gaining momentum. At the moment, competitors have only a miniscule piece of the market, but it's a \$35 billion market. Some of these operations are well-financed, with highly motivated personnel, and are able competitors. ITT is a good example. I expect this competition to continue. I think the telephone companies can give an adequate accounting of themselves with enhanced service offerings, the full exploitation of technology, and pricing techniques to reflect the resulting cost efficiencies. Yet, I anticipate that there will be more competition in the intercity communications market.

QUESTION: One of the highlights of the 1939 New York World's Fair was the television telephone. It is now 1979, and it has not exactly swept the country in the last 40 years. Can you give us some explanation as to what has been the impediment there?

ANSWER: The American people weren't quite ready for the picturephone, even though a former chief executive officer of AT&T thought they ought to be. The cost of providing this service is still very high. It is not the cost of the terminal device itself. Those costs are coming down sharply. But getting an acceptable video signal to the place of business and to the home is a very expensive undertaking. Until we get to a fiber optic transmission path or some other kind of a communications highway into the office and home, I don't think it's going to be a viable service. In the meantime, video conferencing will be the forerunner of picturephone services. As

broadband facilities become available in the local exchange, the picturephone will be a viable service offering that we can afford to offer and you can afford to buy.

QUESTION: Does the Federal Communications Act of 1934, which was one of the first New Deal provisions, as I recall it, preclude you or GTE or AT&T from operating outside the United States?

ANSWER: No. We all have consulting organizations that are operating in the Middle East and around the world. United has looked at several foreign operations in Central and South America, where there are still some privately owned telephone companies, but have walked away from them. We are precluded from telecommunications operations in foreign countries because such systems are government owned, We're not barred from selling expertise, hardware, or anything else at the moment, if one can do business under the Corrupt Practices Act. I might add gratuitously that this Act has put all American companies at a competitive disadvantage in world markets.

QUESTION: Is unrestricted foreign competition good for the U.S.?

ANSWER: One can look at the U.S. balance of payments deficit and its probable impact on American employment and conclude that unrestricted foreign competition is adverse. By the same token, looking at it from a communications user's standpoint, I would have to say that there are some foreign manufacturers coming into the marketplace that are offering comparable equipment at a lower price. If, in our regulated telephone operations, we can buy comparable equipment more cheaply, we can charge lower rates. That's a terribly difficult decision to make, but we're buying some foreign-manufactured equipment just to find out whether the prices and the operational claims are real. Both the quality and the prices are real, unfortunately.

Permit me to get on my political soapbox for a minute. The West German government, for example, is funding the research and development costs of sophisticated electronic switches for a consortium of West German manufacturers. The government is buying the telephone equipment that is manufactured, absorbing all the R&D costs in the process. The German manufacturers can then go to the American export market and price without R&D expense-loading. Meanwhile, what's happening in the States? We have everybody competing hammer and tongs. We have the antitrust laws that won't even let us sit down and talk to each other about product development. It's hurting us in our own marketplace and really hurting us in international markets. The Japanese, the West Germans, the Swedes, and the Dutch have learned their lessons well. They have almost caught us technologically. The Japanese are not only good copiers, they are good innovators, and they've almost caught us. They can now sell quality as well as price, and American manufacturers are losing market share.

QUESTION: What do you see five or ten years hence in terms of the telecommunications revolution as it will affect education, particularly higher education?

ANSWER: The potential is unlimited. The best instructor in any school or university can be made available to every classroom and school across the country. Two-way discussions can ensue, and consensus can be developed via computer polling techniques. Computer/communications will have as much of a revolutionary impact on education as it will have on the business world and the office worker. The capabilities will be there; it will be up to the imagination and determination of our educators as to how far to go and how best to apply available technology. The success of the "university of the air" is going to depend more upon the

desire of both the faculties and the students to utilize the available technology than the technology itself. When we get to the “wired city” concept, this same capability can be extended to the home.

**QUESTION:** Regarding office work and reducing the costs there, it seems to me the heaviest load in running an office is government regulation. How are you going to be able to sell the government on helping cut office costs?

**ANSWER:** We can talk about increasing the efficiency of the office worker and gaining productivity, but how we get the government off our back I don't know. I'm encouraged, though, by some of the things that are being said and done in Washington, and I'm encouraged by the business community finally having something to say on the subject. The Business Round Table has come up with estimates of what it's costing American business, and therefore the consumer, to comply with the red tape bureaucracy reporting. The Japanese and West Germans are beating us at our own game, which we played so well for so long. I'm convinced that unless we can get rid of some government regulation and cost, we are going to trail the rest of the Western world in productivity, and indeed in lifestyle.

**QUESTION:** What is being done to help people understand how they will be able to use the new technologies being developed?

**ANSWER:** For too long, we in the telephone industry have been order-takers. A “don't tell us what you want; this is what we sell and this is what you need” attitude has prevailed. Thanks to technology and the resulting competition, there's been a real change in our industry. We have developed imaginative marketing programs by hiring and training talented marketing personnel. We are studying the communications requirements of individual industries. We study the business you're in and what kind of business communications you have. We'll serve as a consultant to help you understand your own problems and how they can be solved. We are undertaking such marketing efforts on an industry-wide basis. Once we can satisfy the business person, then we'll address the broader market for residential services. We are finally learning the needs and the requirements of those we serve.

**QUESTION:** In discussing the future, you've pretty drastically reduced the number of secretary-typists, you've eliminated the Post Office, you've eliminated meter readers, and you've eliminated the envelope business. With all of this unemployment, what opportunities do you see for increased employment in this new area?

**ANSWER:** People will work in the information industry. This is more than just communications and it's more than just computer services. It's the entire gamut of information-related industries. Some 55% of our work force today is involved in service industries. These service industries will continue to grow at a rate more rapid than that of the general economy. I don't foresee any employment problems as a consequence of the changes I am suggesting. Some retraining will be necessary and there will be some pressure on our educational institutions to concentrate on the information society. There's a shortage of software programmers and computer operators at the moment. This situation will prevail through the 1980's. We seemingly can't train people fast enough. I don't foresee that the information society will cause serious dislocations in employment or employment patterns. We will have to develop a better educated and more productive work force, and such a work force will be required if we are to achieve real economic growth and the ability to compete in international markets.

**QUESTION:** Have you considered using your constituency of stockholders in order to accomplish tax reform and spur investment?

**ANSWER:** Yes, we have. We believe that stockholder groups must get involved. Practically everyone is a stockholder, even though he or she may not have direct ownership of a sheaf of stock certificates. For too long, American investors have been a silent majority. Our company and others are trying to rally our shareholder groups to influence legislation which will bring about tax reform, eliminate the double-taxation of dividends, and promote the formation of capital. Stockholders can be a very potent force, once they are properly organized and motivated.

**PAUL H. HENSON** is Chief Executive Officer of the nation's third largest telecommunications system. He graduated from the University of Nebraska in 1950 with a M.S. in Electrical Engineering. He started his career with the Lincoln Telephone & Telegraph Company and joined United Telecom, formerly United Utilities, in 1959 as Vice-President. He became President in 1964 and Chairman in 1966.

He is a nationally acknowledged and respected leader in his industry, and as such has made many appearances before committees of the United States Congress.

In the national corporate community Paul is a director of Armco, Inc., Duke Power Company, Kansas City Southern Industries, Inc., Federal Reserve Bank of Kansas City, and is a past president of the United States Independent Telephone Association.

His professional and civic activities are numerous and widespread; trustee of the Tax Foundation, the University of Nebraska Foundation, Midwest Research Institute, and the University of Missouri at Kansas City; director of the Kansas City Art Institute and the National Legal Center for the Public Interest. He is a member of the visiting committee of the Graduate School of Business Administration at Harvard University. He also serves as Honorary Consul of Sweden in the Kansas City region.



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**MIDCONTINENT PERSPECTIVES** was a lecture series sponsored by the [Midwest Research Institute](#) as a public service to the midcontinent region. Its purpose was to present new viewpoints on economic, political, social, and scientific issues that affect the Midwest and the nation.

Midcontinent Perspectives was financed by the Kimball Fund, named for Charles N. Kimball, President of MRI from 1950 to 1975, Chairman of its Board of Trustees from 1975 to 1979, and President Emeritus until his death in 1994. Initiated in 1970, the Fund has been supported by annual contributions from individuals, corporations, and foundations. Today it is the primary source of endowment income for MRI. It provides "front-end" money to start high-quality projects that might generate future research contracts of importance. It also funds public-interest projects focusing on civic or regional matters of interest.

Initiated in 1974 and continuing until 1994, the sessions of the Midcontinent Perspectives were arranged and convened by Dr. Kimball at four- to six-week intervals. Attendance was by invitation, and the audience consisted of leaders in the Kansas City metropolitan area. The lectures, in monograph form, were later distributed to several thousand individuals and institutions throughout the country who were interested in MRI and in the topics addressed.

The [Western Historical Manuscript Collection-Kansas City](#), in cooperation with MRI, has reissued the Midcontinent Perspectives Lectures in electronic format in order to make the valuable information which they contain newly accessible and to honor the creator of the series, Dr. Charles N. Kimball.