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Making Sense of New Technology and New Legislation

Introduction

I would like to discuss what I believe to be one of the critical issues of the 1980s for libraries. Thanks to Dean Charles Davis and Professor J.L. Divilbiss of the University of Illinois Graduate School of Library and Information Science for identifying the issue and developing this Clinic.

As I said, telecommunications may well be the key technical and economic issue of the 1980s for libraries. No other resource at our disposal challenges us so much to make good decisions, and no other issue will reward our efforts if we do well, nor punish us so much if we fail to act.

The telecommunications resources we use have allowed us to develop much of the library data processing we use and rely on. Yet, in another sense, much of the telecommunications plant, or facilities that we use, are the traditional copper wires—of limited capacity but nearly unlimited distribution. Typically, libraries have leased this capacity and created private networks that link us together, to our branch locations, and to the bibliographic utilities. Library telecommunications also includes the use of the value-added packet-switching networks such as Telenet (General Telephone Electronics), Uninet (United Telecom Communications), and Tymnet (Tymshare Inc.), for dialing into information services such as Dialog and Bibliographic Retrieval Services, and to a lesser extent into OCLC or between individual libraries or branch locations.

In the last ten years, libraries have become dependent on telecommunications, particularly leased-line dedicated circuits, as we have adapted resource-sharing technology to library technical and public services. While we have learned to rely on certain kinds of service from our telecommunications industry, that industry has been preparing for a profound

change in its structure, and in the types of telecommunications products and services it offers its consumers. The evidence of coming change has been apparent for several years, perhaps even longer to industry experts. Now the change is upon us, and it is apparent that much of what we rely on today will be changed dramatically in the near future, perhaps in the next two or three years. Much change has already occurred, but even more profound developments are coming.

Bases of Change

I believe we can name three major reasons for the changes now underway. They are: (1) the divestiture of AT&T, (2) the development of telecommunications and computer technology, and (3) the emergence of competition in the telecommunications industry.

These three forces are interlinked. It is difficult to differentiate between them—as with all very large-scale changes, many details and forces merge or blend with one another. The emergence of competition is clearly related to the AT&T divestiture, for example.

Background of the AT&T Divestiture

As we are aware, the old monolithic American Telephone and Telegraph Company (AT&T) has been changed unalterably. Since 1 January 1984, we have had a new AT&T, which retains some portions of the old predivestiture AT&T such as the Long Lines Division (now called AT&T Communications), and equipment sales (now called AT&T Information Systems). Gone from the AT&T family, however, are the old local operating companies such as Illinois Bell and Chesapeake and Potomac Telephone Company. The AT&T local operating companies have been divested and are now organized into seven regional holding companies. These regional holding companies—NYNEX, Bell South, Bell Atlantic, Ameritech, Pacific Telesis, Southwestern Bell, and U.S. West—are still in the telecommunications game. In addition, there are approximately 1500 other local telephone companies in this country.

Despite the apparent suddenness of the divestiture, it did not spring out suddenly on 1 January 1984. In fact, there is a thirty-five year history of Federal actions, primarily brought by the U.S. Department of Justice, which led toward the divestiture. Some of the critical dates in this chronology are 1949, 1956 (when AT&T agreed to a Final Judgement that precluded its participation in computer sales, among other things); 1969 and 1974 when one or another proceeding was introduced into court against AT&T, or an AT&T competitor was upheld in seeking access to AT&T markets. In 1982, AT&T and the Department of Justice announced an

out-of-court settlement by which AT&T would accomplish the complex undertaking of dividing its assets, and becoming eight completely separate organizations.

It is important to note that with AT&T divested of its former monolithic structure, we now have a much more competitive marketplace, with more companies offering service. Indeed, some of the former AT&T operating companies have announced their entry into markets formerly denied to them by virtue of the Final Judgement of 1956. In addition to the divested AT&T companies, the new AT&T and the other telecommunications companies such as MCI have all been engaged in developing and marketing products and services which it is hoped will benefit the users. With this competition has come substantial technical, economic and regulatory change. We can expect, furthermore, the rate of change to accelerate in the future.

Technical Aspects of Telecommunications Change

Let us look at the technology of library telecommunications. In one technical sense, much of what we use in the library community might be called POTS—Plain Old Telephone Service. It is not universally true, but most of the library telecommunications environment is oriented around voice-grade, copper-wire plant, particularly in local exchanges.

Telecommunications switches, the devices that link individual subscribers' lines to complete either local or long-distance calls, have become more sophisticated as they have been computerized. In this country, whether the plant is fully computerized or not, the facilities work together very, very well. Nevertheless, much of the present local-exchange telephone technology is low-speed, voice-grade, low-technology telephone service. Consider that the device which links many computer devices to telephone lines—the modulator-demodulator, or “modem”—is needed to emit or receive tones in the range of human hearing that the telephone system has been designed to support. While our computer devices use binary (or digital) codes which offer very high transmission capacity, much of the telecommunications system still uses analog techniques and facilities which are inherently of lower capacity.

A critical economic and regulatory factor for libraries is that this type of voice-grade service is about to be affected drastically by new tariff structures which may double library telecommunications expenses in the next two years or sooner. The reasons for these new price structures are many and varied, but the primary thrust of increased prices for the type of telecommunications libraries use comes from the local telephone companies, those that operate and maintain local telephone exchanges and lines. The local exchange companies claim, perhaps with some justification,

that their costs have always been higher than the prices they had us pay, but that in the past they had subsidies from the long-distance services to pay for local deficits. The breakup of the monolithic Bell System effectively terminated the cross-subsidization of local service. The subject of the Bell breakup is important to our discussion of economics in library telecommunications, and I will return to this later.

First, let us look at what the future may offer in telecommunications technology. In the early 1980s, a European telecommunications standards group called CCITT—Consultative Committee on International Telephone and Telegraph—put forward a concept of a completely digital telecommunications system. That is, the CCITT proposed that virtually all long-distance telecommunications transmission and reception would be in a binary digital code. If telephone service is called POTS, this might be termed PANS—Peculiar and Novel Services. The concept that CCITT put forward is being called ISDN—Integrated Services Digital Network. ISDN would have an enormous capacity, and by digitizing all transmission, could mix voice, computer data and video in a single switching and carrier package. The standards necessary for the adoption of ISDN are in preparation, and they are expected to be completed by the end of 1984. Some ISDN-compatible terminal equipment may be available by 1986. When ISDN becomes commercially available to end users, we will have enormous telecommunications capabilities which will terminate wherever there is sufficient demand.

Let us understand, however, that the costs for an ISDN conversion will also be enormous. We should also understand that the library community is a very small part of the total telecommunications market, and that very high-capacity telecommunications facilities will be difficult to justify for many of us. That is to say, there are several economic issues we face.

Telecommunication Futures: Economic

Economically, there are literally billions of dollars involved in current telecommunications products and services. AT&T estimates that its private line business in 1983 alone was \$2.14 billion. The library portion was estimated at less than \$10 million, or something under 0.5 percent. Dr. Walter Bolter, the American Library Association's consultant on telecommunications issues, once noted that libraries' use of private-line service was so slight a portion of AT&T's total private line business that our payments could disappear from an AT&T financial report as a rounding error.

Clearly, library telecommunications, whether leased-line or value-added network, represents only a fraction of the total telecommunications

market. In many respects, however, our use of telecommunications cannot be judged on economic grounds alone, because our uses transcend purely economic issues. But, as providers of information, libraries' activities which depend on telecommunications will be captives of higher prices.

I have already discussed the potential impact of proposed new tariffs for our type of private-line service. With local telephone loops increasing in price by as much as 400 percent in some states, and with the cost of new, high-speed technology likely to be very expensive, we should be asking ourselves some critical questions. How can we adapt? How can we continue to provide service in the face of very large price increases? How can we adapt to services which will be very capital-intensive, and whose costs will exceed our capabilities to pay?

I believe we will adapt to new telecommunications by entering into creative technical partnerships, by looking to stronger institutional ties, and by taking advantage of shared activities.

Telecommunications Future: Technical

Let me share with you some probable developments in telecommunications which will affect all of us. These ideas are not a prognostication, but a simple description of probable future technology.

In the Integrated Services Digital Network environment, all telecommunications will be digital, using various transmission media. Such telecommunications standards as AT&T's T-1 carrier will travel by mixed-medium, mixed-architecture transmission channels. Probable choices for the telecommunications architecture include digital microwave radio, satellite, coaxial cable, and light-guide fiber optics. Significant problems remain to be solved, however, before any higher-speed communications can be implemented at the local exchange level.

As we noted earlier, much of the local telecommunications plant is not capable of high-speed transmission. The problem of moving data from hub locations to end users has been called the "last-mile problem."

While there are a number of possible techniques for handling the "last-mile problem," some of them will represent a direct threat to the telecommunications industry. For example, a system called Digital Termination Service (DTS)—digital microwave radio—is being tested in the Washington areas at this time. Local Area Networks (LAN)—various coaxial cable or wire pair systems for use in transmitting data in local settings—have been much discussed recently. In addition, a number of other, probably unfamiliar, delivery organizations are interested in providing local telecommunications capabilities. These include local electrical utilities, and the local cable television systems. These types of telecom-

munications systems will simply “bypass” the local telephone company facilities.

Another type of facility being discussed is the “wired campus,” which as its name implies, is a local network which links the buildings on a university campus. The University of Pittsburgh is one institution which has made a commitment to a campus-wide local network. Yet another possibility is the “smart building,” wherein the actual structure of a building will contain the telecommunications logic controls for all the tenants in the building.

Clearly, the choices for future telecommunications systems are many and varied, and we will be challenged to make good choices in our use of the systems. And, again, we will likely find ourselves making alliances in the future to be able to use and afford new telecommunications technology.

Legislative Issues

In order for us to arrive in the future, we must survive the present, and we are aware that price increases threaten us immediately. Let us turn now to a brief review of the legislative relief from massive price increases the library community sought in the 98th Congress.

As an opening statement, let me note that recent reforms or amendments to the Communications Act of 1934—the basic telecommunications law—have not fared well in Congress. In the 97th Congress, Congressman Wirth of Colorado introduced legislation which might have eased the burden of telecommunications increases for libraries. The bill was withdrawn after, among others, Congressman Corcoran of Illinois moved to block the bill coming out of committee.

In the 98th Congress, elected in 1982 and due to expire this fall, legislation was introduced in the Senate (S. 1660) and House (H.R. 4102) which, in the amended Senate version, would specifically have prevented price increases from affecting libraries. We should thank the American Library Association, particularly Eileen Cooke and Carol Henderson of the ALA Washington Office, for having worked long and hard on an amendment to this legislation, and to Senator Larry Pressler for having sponsored it. Despite the best efforts of the library community, S. 1660 was not reported out of committee, and therefore is effectively dead for this Congress. While we can hope that the House and Senate will look kindly on our needs in the future, there is no hope for direct legislative relief in the current year (1984).

Yet, there is little doubt in my mind that we need some type of relief. In January I had the opportunity to speak with representatives of AT&T, the Federal Communications Commission, and the U.S. Senate, all within a

few days. Each group recognized our problem, and each group suggested that we look to one of the other groups to help us solve it. When everyone suggests that we look elsewhere for help, then I believe we must look to the legislative or regulatory sectors for short-term assistance with increasing prices. While our long-term solutions may be technical, libraries must have help to overcome the short-term price increases we are all facing at this time.

We do not wish to conclude with the idea that our outlook is hopeless. Your interest has brought you here for this Clinic, to hear speakers knowledgeable in the many areas of telecommunications important to libraries. You have an opportunity to learn about telecommunications and its challenges. We in the library community have friends in Congress, we are organized and our professional concerns transcend economics. We can accomplish a great deal when we work together to face a challenge, and the changing nature of telecommunications is certainly a challenge. I believe we can and must rise to it.