

Incidental Paper

**Coordination Workshop
October 18-19, 1984
Report of Proceedings**

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Program on Information Resources Policy

Harvard University

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INTRODUCTION

On October 18-19, 1984, the Harvard Program on Information Resources Policy brought together 20 people from among the providers and large users of telecommunications services, and from interested government agencies. The objective was to find out what they think about needs for coordination in the new telecommunications environment. This report explains what went on in the Workshop; it captures some of the more important comments, and it brings together the ideas which suggest the need for further action.

The Workshop had a limited objective: To find out if the people closest to the activity of the marketplace think that there are serious problems amenable to relief through more or better coordination among suppliers, users and regulators. No answers were offered; no attempt was made to obtain a consensus about suggested solutions.

To the extent that coordination needs could be identified and described, the Workshop achieved its goal.

EXECUTIVE SUMMARY

The more important conclusions drawn from the discussion concerned technical standards, end-to-end quality control, an unstable market environment caused largely by regulatory uncertainties, and the need for the re-examination of strategic goals among corporate suppliers and users of telecommunications. More specifically:

1. Interface standards for hardware are developed though a system designed many years ago with fairness as its primary goal. This system is too slow for the pace of innovation in today's communications world. If it isn't made faster, soon, the nation will face more problems of the VHS-vs.-Betamax type, and more rather than fewer difficulties in connecting computers with peripherals, with networks, and with systems supplied by different vendors.

Speeding the standards process will require the use of more resources of the same type now employed, plus some additional players and streamlined procedures. These changes can be brought about if:

- a.) High officials of business and government become both interested and concerned;
- b.) Serious attention is given to the tendency of other nations to use standards as a tool for protecting their own authority over telecommunications, and for strengthening domestic industry; and
- c.) Large users of telecommunications services agree to participate, in order that new standards reflect their knowledge about what they need.

2. Eventually, incompatible technologies will be interconnected through interface hardware designed for this purpose. The extent to which this approach is necessary will depend upon the compromises achieved in the standards-setting process.

3. Among the casualties of the AT&T divestiture was a unified system of end-to-end quality control over telephone service. A long-distance call involves up to five suppliers, each with its own quality-control system, generally not coordinated with the others. Early indicators suggest that the expectations of the public and of business users are not being satisfied.

4. Uncertainty about prices, and about who will be allowed to do business in what markets, adds greatly to risk and confusion. The courts, the commissions, and the Congress are all involved. The only certainty is that the present division of the market is unstable and cannot be depended upon for planning purposes.

5. Most players agree that a principal virtue of today's telephone system is that it reaches nearly everyone. But "universal service" is beset by a large number of questions about the extent of probable price increases, the elasticity of the market, and the adequacy of such solutions as "life line" tariffs and the like.

Much light would be shed on this issue if someone would examine the questions dispassionately, define the terms, and quantify the expectations. Then perhaps the industry and its regulators will come to grips with the problem, the dust will settle, and those involved will be able to plan on at least the general level of prices. In the meantime, the emotional appeal of the universal service issue is an impediment to dealing effectively with other important questions.

6. Almost every large user, government agency, and regulatory commission should rethink its own goals with the respect to telecommunications. It is not so much that the objectives of one will run counter to those of another (although that may sometimes be the case); the important thing is to identify the tradeoffs which EACH ONE will face. It might help if diverse groups were to get together and just talk about this -- groups small enough to permit full discourse and diverse enough to bring out every point of view.

Even the regulators who deal with communications questions every day appear to this group of observers to be as confused as everyone else, unsure about what is really happening and why. If this is so, they might welcome the chance to participate in such a discussion.

PART ONE

Questions Identified in Advance

Introduction

The objectives of the Coordination Workshop, more fully described in the Appendix, required that the discussion be largely unstructured, or at least not structured according to the notions of the sponsoring Harvard Program on Information Resources Policy. The sponsors, sensing that an important problem might exist, sought to test that hypothesis and, if it proved true, to let the problem be defined by the participants. Accordingly, each of them was asked for a preliminary statement, upon which the following notes are based.

Some of these perceptions of the problem were addressed sufficiently during the discussion to contribute to the conclusions of the Workshop. Others were not. This may be because the ideas of the participants were changed in the course of discussion, or it may be that time, relative importance, or other circumstances account for the remainder being, essentially, unfinished business. It is important, however, that these initial thoughts not be lost, and that these questions, problems, and issues be identified as having been described in this way prior to the discussion of the Workshop.

Problems and Questions

I. Problems presented by jurisdictional boundaries and overlapping spheres of interest:

1. Shifting patterns of federal and state regulation make planning and forecasting difficult, if not impractical.
2. Questions of what is to be regulated, and by whom, impose on carriers great uncertainty and, sometimes, the inefficient use of resources.
 - a.) At the federal level alone, policy is influenced by the FCC, the DoJ, the NTIA, the GSA, and the DoD, among others.
 - b.) In the international arena, the DoS, DoC, DoD, and the FCC are all involved.
 - c.) Conflict among state regulators, and between state and federal regulators, threatens to impose serious constraints on the development of efficient nationwide telecommunications networks.
3. There is no effective, visible activity directed to improving inconsistent regulatory policies and objectives. In the words of a participant, "Far from promoting uniformity, harmony, and efficiency in the

regulation of national telecommunications networks, the 'St. Louis Plan' will Balkanize telecommunications regulation and burden interstate carriers, and thus users, with numerous inconsistent regulatory schemes and rate levels."

II. Problems presented by the convergence of telecommunications and computer technologies:

1. Computer and telecommunications needs and resources are so interrelated that they should not be dealt with separately by regulatory authorities.
2. Within the federal government, coordination of needs of communications systems, while helpful, becomes almost meaningless unless there is similar coordination of needs for computer and data systems.

III. Questions associated with network architecture:

1. Does the open architecture of an "intelligent" public switched network require a degree of coordination which is simply impractical in a competitive network environment?
2. Is competition inherently incompatible with the integrated nature of telecommunications systems?
3. Will there be one ISDN (Integrated Services Digital Network), or many? If there are many, will it be because this is the best answer to the needs of the market, or because this answer is forced by competitive constraints on coordination?
4. Standards can facilitate innovation and competition, or frustrate them; how can the optimum degree of standardization in telecommunications be identified?
5. The deliberate pace of standards-setting activity is so slow as to be inconsistent with the rapidly changing needs of the telecommunications market.
6. The importance of user participation in standards setting, given the fragmented character of the telecommunications market, isn't appreciated by most of corporate management, which is therefore reluctant to commit adequate resources to the effort.

IV. Questions related to the positions of users in the market:

1. Can an integrated national system, sufficient to the

needs of national security, be made to be workable in a competitive environment?

2. Divestiture has put users into the position of having to coordinate among suppliers -- a task once performed by the dominant supplier. One statement said, "The shift of coordination from the vendor to the customer will create an additional demand for increased staff and costs in performing this function." What of the customers who lack the resources to look after themselves?
3. Is coordination compatible with the market's need for flexibility?
4. Cost definition and pricing for exchange access have the potential for harming (or for benefitting) particular users and providers. In a hybrid (partially regulated) environment, any solution is political: How can all stakeholders be heard in efforts to resolve this issue?

This arrangement of the questions was designed to stimulate discussion at the workshop, and for this purpose it proved to be useful. The list is clearly not all-inclusive, but it does reflect what the participants considered important BEFORE any discussion with the others present. In particular, it became apparent that the needs of international markets and foreign trade were not adequately expressed in these preliminary observations.

PART TWO

Needs Described

Introduction

An observer trying to identify a consensus during this discussion might be reminded of an analogy: Imagine 20 strangers who find themselves isolated in a strange place, trying to describe where they are. Each will describe what he/she sees in terms drawn from his/her own background -- the engineers will see structure, the sociologists will see behavior, the scientists will segment and classify, the managers will synthesize, and so on. Each participant described the industry as in a state of present chaos. For example, those whose main interest had been technical were concerned mostly with maintaining an integrated system; those from supplier industries saw the problem as early identification of coming needs for hardware; those whose interest has been largely in national security were sensitive to the needs of large customers to survive the loss of the de facto coordinator -- AT&T.

Not surprisingly, the standard of reference for most participants was "the way we were." How, they wondered aloud, can the level of service we have known in the past be maintained in the future? A very few, having spent their lives in a competitive commercial world, seemed just a bit surprised (or perhaps seemed as if they HAD BEEN surprised recently) to discover that telecommunications networks require a degree of coordination not common in industry and commerce generally. There was an internal conflict in some of the comments: It was easy -- perhaps TOO easy -- to point to failures among public policymakers to "get their act together," and yet no one advocated that a specific public agency should take the lead in making that happen.

Recent entrants among the carriers also showed that they were discovering things not really new: "Public agencies lack understanding of investment and operating requirements." One is tempted to paraphrase a famous observation about democracy: This is a crazy way to run a business, but perhaps not as crazy as all the alternatives. Certainly life would be easier if there were a comprehensive public policy about telecommunications objectives, understood by and acceptable to all!

And if frogs had wings, etc.

The sequence of the following comments, which the author drew from the discussion, is not strictly chronological, because they did not come out in an orderly manner -- nor should it be expected that they would in such circumstances. The ideas here, although expressed in the discussion, project beyond anything said specifically in order to convey conclusions which were only implied. In other words, the

author of these notes has taken some license and accepts responsibility for doing so.

The discussion focused on three kinds of problems: those dealing with public policy, with technology and its applications, and with the effects upon users of networks.

Comments Relating to Public Policy Questions

. Two broad public-policy goals were acknowledged: 1) universal service and 2) dynamic, state-of-the-art business communications.

Specific actions or proposals which favor one but work against the other force political compromise, but such compromises can be worked out if both goals are acknowledged and accommodated in the compromise.

. To the extent that a subsidy is required to achieve the first goal, that need should be measured and should be satisfied by specific rules, taxes, or fund transfers which do NOT, themselves, inhibit the second goal. On the amount of necessary fund transfers, the constituents of the policymakers have not been heard from, in the opinion of most of those present.

. There is some evidence that in the course of regulation, arbitrary distinctions (e.g. between voice and data use, or between basic and enhanced services) have been imposed by inadequately informed people for short-term purposes. Added to any possible short-term effect is the risk that these distinctions will remain long after they are useful, even if they ARE useful in the short run.

Example: Enhanced services have NOT developed apart from the public-switched network, from which they are excluded by law, because they entail high risks. They are practical, now, only as marginal additions to large basic services.

. The breakup of the U.S. telephone system through divestiture is being watched carefully in other countries, where government agencies responsible for domestic telecommunications seek to maintain control over their systems as digital technology is rapidly introduced. They vie with each other, and with the United States, to influence the standards-setting process in the interests of their own manufacturing industries. This is most visible in the selection of data-interface protocols.

[Observation: The two bulleted points immediately above illustrate the blurred boundary which often separates questions of public policy from those of technology. R.M.A.]

Comments Relating to Technical and Operational Questions

. Distributed versus centralized intelligence in networks SHOULD be a technical or a marketplace issue, in the opinion of those who expressed themselves on this point. It is perhaps the best recent example of policy's impeding the optimum use of technology.

. When new services become available, coordination questions will be faced. For the solutions, "look to the motivating forces and supplier imagination." Private networks rise to meet advanced market demands, or to avoid umbrella pricing. When there is a need to interconnect private networks in the absence of a "chip" to interface incompatible protocols, then public policy questions are raised that require coordination. Motivation to coordinate, in the usual market sense, may not be present.

. The impending development of one or more ISDNs (Integrated Services Digital Networks) presents a critical time-sensitive question. An ISDN is characterized by:

- 1.) end-to-end digital service,
- 2.) use of a standard, stable interface protocol, and
- 3.) unlimited varieties of use within the limits of that protocol.

The importance of developing the "standard, stable interface protocol" focuses attention on the standards-setting process. The opinion was expressed that the speed of this process is not consistent with the pace of advances in technology. Speeding the standards-setting process clearly will require additional resources, and some participants thought that these will be made available only when there is greater corporate understanding of the need than exists today.

If we fail to speed the process in this country, there is a risk of increased vulnerability to manipulation of international standards in favor of maintaining tight domestic control within each nation, in the interest of each "PTT" and of domestic manufacturers.

[Observation: In this case, the solution to a technical problem exposes a higher-level policy misuse. R.M.A.]

. The operational coordination (e.g. testing) of inter-LATA services is inhibited to some extent by the recent fragmentation of the industry.

It is unclear whether this is a permanent, long-term problem; some thought so, others not. While carriers are slowly reaching an accommodation on testing through the exchange carrier interface, the customer is sometimes unsure of just who is his supplier.

. Emergency preparedness is inhibited by the absence of cooperative measures to deal with traffic overflow.

[Observation: It is unclear if this is a permanent or only a

short-term problem. It is aggregated by one carrier having a disproportionate market share, and facilities to match, so that customers depend on that source for fall-back support. R.M.A.]

Comments Relating to User Questions

. Sudden changes in rate structure are like uncertainty in investments -- they add greatly to risk and make rational planning difficult. The threat of rate deaveraging in the long-distance marketplace presents that kind of a problem today; it is caused by national policy favoring competition, and one of its effects is to destabilize the environment for both suppliers and users.

. The availability of service in unattractive markets is already an issue, though it is not yet highly visible, affecting specialized needs for the most part.

[Question: Is it regulated prices that make a market unattractive? Why should service not be available if the price is open to negotiation? R.M.A.]

. The presence of multiple sources in the market (with lessened regulation) imposes greater resource requirements on major users who must now protect themselves. They expressed the view that they do not want to get involved in the pricing and cost allocation problems of their suppliers.

[Question: Is it realistic that they should NOT be involved, as long as pricing is a public issue? R.M.A.]

. The convergence of telecommunications and computer applications presents some users with overwhelming "opportunities" which exceed their levels of understanding. This is not JUST a problem; interpreting technology is a business opportunity for some.

[Observation: It is unclear whether regulated prices or other considerations make a market unattractive. One would expect that if a price is open to negotiation, service will be available. Furthermore, as long as carrier pricing is a public issue, it appears unrealistic to expect that major users should NOT be involved. R.M.A.]

PART THREE

Opportunities

Introduction

An initial premise of the Program on Information Resources Policy, sponsor of the Workshop, was that among all of the questions, problems and issues facing suppliers, regulators and users today, some are being addressed with appropriate resources, some are receiving inadequate resources, and some are neglected entirely.

Indeed, the principal objective of the Workshop was to find out if there are any important questions in the second and third categories; if there are, then these present opportunities for either public or private action, or both, to improve the situation.

In the opinion of those present, there are several important questions needing more or higher-level attention, and the discussion identified the nature of several of these. There was no consensus sought as to exactly what should be done, but the following generally describes the more important opportunities.

Opportunities Identified

- . Develop an education ("management awareness") program to improve information flow inside organizations, between technical and financial managers. Objectives: to improve the rapid implementation of technology and to increase corporate resources dedicated to standards development.

- . Re-assess the established standards-setting process in search of greater efficiency.

- . Create an industry forum within which carriers can explore opportunities for improved customer service through coordinated testing of facilities, networks and services which are dependent upon two or more suppliers.

- . Research the level of financial support required to maintain universal service, and determine where, precisely, this need exists; shed light on, and remove heat from, this issue.

- . Create a forum wherein suppliers and users can explore questions of mutual interest with the objective of better defining THEIR OWN goals, and within which public officials can work to identify true public issues not amenable to private solutions.

- . Develop a resource for regulators through which technical, policy and strategic issues (including the U.S. position in international trade) can be explored informally in an informed way,

with assurance that all stakeholders are represented. Objectives: to improve the quality of filings before courts and commissions and to improve the level of understanding of what is in those filings and why.

APPENDIX A

Why, When, Where, Who of the Workshop

Origins

"Out of sight, out of mind" is an expression which might well be applied to the role of coordination in the developmental history of the telephone system of the United States. Since at least the second World War, while the public switched network experienced extraordinary growth, and while the national security and emergency preparedness agencies of the federal government became increasingly dependent upon this network, the role of coordinator was filled by the American Telephone and Telegraph Company. Independent companies, state and federal agencies all were important participants, but all looked to AT&T for leadership -- and in this they were rarely disappointed.

The earliest suggestions for breaking up the massive Bell System were criticized, in part, because they threatened this coordination role. By the time the recent antitrust trial heightened public interest in the issues before the court, the matter of coordination had been almost lost to view, buried under countless other issues of market practices, cost definition, "harm" to the network from the attachment of "foreign" devices, the generic virtues attributed to competition, and interpretations of the antitrust laws. The network worked, obviously, and at this point only a relatively small number of industry insiders close to the coordination function were visibly worried about this particular consequence of divestiture.

Publications of the Program on Information Resources Policy began to address this issue as early as 1980 in Robert H. Klie's Communications Network Management. The most recent of these was Coordinating Domestic Telecommunications Facilities and Services in a Changing Environment, by Kurt Borchardt, published in 1983. An earlier workshop on Network Management Policy, chaired by Lee M. Paschall in 1981, was well-received, and following production of the Borchardt paper the idea developed to hold a second workshop to address coordination in the post-divestiture environment. Early tests of the idea with interested Affiliates of the Program were encouraging, and invitations were then issued in early September 1984.

Arrangements

The invited organizations included a diverse group of carriers, equipment suppliers, large users of network services, and government agencies involved in regulation or policy development. Among those who accepted, the balance was uneven, although each of these groups was represented among the 19 participants which met in Cambridge on October 18th. The workshop leaders had hoped that representatives of national security and federal regulatory agencies, and of large users, would make up a larger proportion of the total -- although it would not be possible to identify any participants for whom they might have

substituted, and the workshop size was limited to assure a lively discussion.

Each participant was requested to furnish, in advance, a statement of his/her interest in coordination. From these statements, an abstract was prepared to help focus what was otherwise a mostly unstructured discussion. Four discussion periods were identified as dealing with Public Policy, New Services, Operational Matters, and National Security/Emergency Preparedness. Program researchers recorded the proceedings for reference use. Philip E. Areeda, Langdell Professor of Law, Harvard University, gave an overview of antitrust law as it might apply to coordination efforts.

The workshop concluded with a brief discussion of possible useful initiatives, and with the promise of a brief written summary of the proceedings.

APPENDIX B

Selections from the Transcript

Paraphrases and quotations of interest from the transcript on the subjects of:

Conference Objectives

. . . . We are here "to see if there are some questions, and if there ARE some questions, to see whether they are worth addressing with some priority as matters of common and national concern."

. . . . Our purpose is to search for policies and practices which will facilitate effective competition across virtually all aspects of the industry in a fashion that does not undermine the sort of integrated service from the public switched network to which the ordinary telephone user has become accustomed.

. . . . We are here to examine what appear to be very differing goals among the policymakers with respect to the obligations of and the opportunities for the divested Bell operating companies.

. . . . (From a user representative) In the past, telecommunications services have been well coordinated, highly integrated, technically standardized; in the future it's going to be vital to us to keep that level of standardization and coordination as we move to new technologies and a variety of vendors.

. . . . My concern is the potential being created for a network that's high in cost and not workable, because of conflicts between regulators at the federal and state levels.

. . . . (From a government representative) How is the needed coordination in a fragmenting market to be made compatible with the objectives of competition for greater network efficiency, greater productivity, and utilization by users?

. . . . How do we maintain a high quality integrated telephone network when almost every call will require the participation of five or more separate, independent companies?

. . . . We should clarify the need for standards coordination, and the need to get end users more involved in the standards-setting process.

Public Policy

. . . . The apparent objective of the St. Louis plan, to extend within limits the amount of flexibility each of the states would have in treating its particular policy interests, is inconsistent with the need for a close, tightly coupled, uniform national policy.

. . . . While not inherently bad, 51 different policies, 51 different approaches to ratemaking, are not pro-competitive from the standpoint of making it easier for new companies to come into the business and operate efficiently.

. . . . An uneven rate structure, nationwide, will require that carriers reassess what it means to stimulate markets in which they have an unfavorable differential in access charges. We are heading back in an odd direction!

. . . . Are the cooperative efforts of industry adequate to address the quality-of-service problems across all these diverse networks? At the federal level there does not appear to be any willingness to help with these problems.

. . . . The key strategy is to come up with a formula for better business services without severely affecting the average telephone user.

. . . . Really trying to understand the universal service issue is no small task; where is the competence to deal with it? Isn't the overriding objective to insure that the issues are competently dealt with in a fair-handed way?

. . . . Some regulators, perhaps, have higher on their agenda of priorities this concern about the small user. There is no consensus on the extent to which the small user should be protected, nor the most effective way to do it.

. . . . If a subsidy is needed to keep people on the network, and if this question can be isolated and taken care of by itself, the cost to society will probably be small. We can then get on with other issues and deal with them in a more rational way.

. . . . (From a user representative) A large part of the bill I receive really relates to the manipulation of the carriers' costs. It looks like I'm involved in my supplier's cost-management system. It's like my dealing with a hardware vendor and then having to sit in on the determination of how he's going to price his product. It's a strange place to be, and I don't like to be there.

Technology and New Services

. . . . Concurrent with looking forward, you have to give consideration to measuring and recording the condition of the present system from a technical standpoint.

. . . . The thing that's necessary to know is what you've got right now and how it's working. If you don't know that, how can you tell what you need? What is the situation in this country today? Who do I go to to get an answer to that?

. . . . A sophisticated private user can build a network or acquire it under contract to deliver what he wants at a price he is willing to pay. The problems arise when you get a large number of these and then want to interconnect them.

. . . . "Even the largest, most self-contained private network at some point in time has to cross over, has to get out into the world, and it wants to do that with the least amount of trouble."

. . . . The CCITT approach to standards is too slow for the dynamic environment we are in today -- with the rate at which technology is changing and user needs are emerging.

. . . . The people devoted to standards should be working on them full time, with larger resources than have yet been committed by many organizations. There is a need for both user involvement, to know what the services are going to be, and also for people with very specific, very detailed, highly technical knowledge. It requires a sizeable investment by companies to expend this kind effort, so you find there's a relatively small number participating.

. . . . "There has to be more active involvement of the management of the businesses with the people you have on the standards-making groups."

. . . . If people are committed with dollars to a particular position, and others are diametrically opposed, then you have waited too long; you will not succeed in developing a standard. Before those big dollars are committed, your chances of success are greater.

. . . . The reason you get this tugging and hauling at the standards-setting level is because various people have various interests, and because there are various technical solutions available. There are always a multiplicity of engineering solutions, depending on what your values are.

. . . . When the DDD (Direct Distance Dialing) network was being defined, the environment was largely controlled by one company. One could be less precise in defining interfaces before taking each step. For an ISDN, the interfaces will have to be defined in excruciating detail, in advance. The standards process is much more critical than it was.

. . . . But the price of incompatibility, today, might be just a clever "chip."

. . . . Almost every European nation has a different television standard, and all of them are different from ours. Yet there's no problem in pumping television programs from one country to another.

. . . . ISDN in North America will be an evolutionary development, driven by demand and by technology. Internationally, it is more of a political problem, where some countries view it as a "magical solution to giving them an integrated capability."

. . . . Some cynics say that ISDN is being pushed by the PTTs that want to retain their monopolies because this is their hold on the single network within each of their countries. Some say that what's evolving out of the CCITT are standards that are going to result in an "ISDN" that will provide less than what we now have available from our competing digital networks, and it's going to cost more.

. . . . If there's some national interest in retaining control of a network, that can be accomplished. It will cost money, but compared to what goes on inside the country, it won't be MUCH money, just like it's not very much money with respect to television.

. . . . Take cellular radio as an example; there's a real hodge podge of standards in Europe, and they cannot intercommunicate with cellular radio right now. That's for very specific nationalistic reasons.

. . . . CCITT tried to develop a stable interface that's independent of the technology employed in the network. When you have user-owned equipment that is network-technology dependent, and then the carrier wishes to upgrade the loop to provide better service, it must deal with everyone who owns terminal equipment -- who may or may not cooperate.

. . . . If the FCC decision in CI-2 were carried to its logical conclusion, the last "stable interface" would be inside the network, so that at the terminal there would be a different interface for each kind of loop facility.

. . . . The clean bright line between network and terminals really isn't there; it's almost an "Emperor's Clothes" situation. When you step back and ask if this distinction makes any sense to the users, the service providers, or to the equipment providers, I think 98% would agree that it probably does not. The present waiver process MAY allow a graceful way for that situation to be corrected, if the user gets the option of dealing with either a stable or a nonstable interface. This might offer the best of both worlds.

Operational Coordination

. . . . In the marketplace there is a great demand for a single point of supply, to "put the whole thing together." That in itself could be a potential line of business.

. . . . There's a considerable history that says that a communications network might consist only of transmission facilities connecting nodes which are part of the computer business. The treatment of switches in the Communications Act, and before it, is quite different from the treatment of transmission lines.

. . . . Trying to distinguish function by making a distinction between voice and coded transmissions is what got us into a mess in the first place. Trying to distinguish communications from data processing is going to get us into an equally absurd situation.

. . . . We are looking at political, legal lines of separation; they are not now, and perhaps never have been, technical lines.

. . . . (From a user representative) These artificial distinctions distort business decision making, for applications can often be implemented in either of two ways: through telecommunications or through computing. The "hassle" and the uncertainty associated with telecommunications make that the high-risk approach. The safest way to go is through computing technology.

. . . . It's unfortunate, for once an application is implemented one way, even though a more elegant way will come out in the future, there will be such sunk investment in technology the other way that it, in effect, will be the "standard."

. . . . For the short term, maybe that's necessary to accomplish the objectives that were established.

. . . . The CI-2 prohibitions apply only to AT&T and the Bell companies; GTE can provide intelligence in the network; United can. Without AT&T and Bell, however, there just isn't a market large enough to pay for the product, so the rest can't get a switch that does everything they want it to do.

. . . . In a private network, you optimize the network design to use computation and transmission in the most appropriate places. But you can't do that in the public network.

. . . . There's a whole area of experimentation which is part of the original argument for diversity which, advertently or inadvertently, we seemed to have ruled out. There appear to be accidental barriers to entry.

. . . . "New services have not been shown to be high return kinds of things. They have been done as adjuncts to other services where there has been a stable base of revenue or stable cash. The barriers are very real."

. . . . That's why "custom calling II"-type services have not been made available to casual users, to small businesses, to residential users. The very large user can build his own capabilities for himself.

. . . . Perhaps the technical reality and the current legal reality are "out of whack."

. . . . There is no provision in the structure of the industry today to deal with operational problems on an inter-LATA basis. Exception: The ECSA recently proposed to set up a carrier liaison committee.

. . . . "The customer that buys a General Motors car doesn't worry about the fact that some other company provided the tires."

. . . . There really isn't a new coordination problem here that requires new mechanisms; it requires companies not accustomed to dealing across boundaries to set up processes among themselves.

. . . . If we carriers have a lot of customer dissatisfaction, we ought to find a way to arrange something among ourselves to provide end-to-end quality service.

. . . . With each responsible for only its own assets, how are you going to get somebody to take responsibility for the whole thing?

. . . . Three years ago, the word was that where there's a demand, private enterprise will step in. Now we are hearing a different story. . . . Any solution is going to have a high political content. . . . There'll be no action until the problem is quantified, somehow. I keep coming back to how is that system working today?

. . . . It's not that things are worse than expected; in fact things are more or less like anybody who knows about the system would expect them to be. Maybe we need a little more patience before we decide there's a problem requiring some new coordination effort.

National Security / Emergency Preparedness

. . . . Certainly there's less capability for the network to sustain a loss and still have some grade of service than there would have been had divestiture not occurred.

. . . . Having more carriers provides the appearance of real diversity. It isn't necessarily so; the networks can't be interconnected.

. . . . It's going to take an interplay among a number carriers to move inter-LATA facilities around in a crisis. The traffic patterns are only known to the carrier that owns the traffic.

. . . . Rerouting services after a failure is done more by users than by carriers. I don't know of a big user who hasn't split his traffic

. . . . In the average restoral situation, you fix it before you could make all the necessary arrangements with other carriers -- unless you pre-arranged it Depends upon some sources of funding.

. . . . From a technical point of view, we have been trying to develop a new set of network management controls that could operate given the new structure of the industry. In discussions through the interexchange compatibility forum, the general reception of the industry has been positive.

. . . . We can develop the technology to do it; the question is, from a business point of view, are the interexchange carriers going to play that game?

. . . . Discussion is taking place at the technical and operational level. At the business level, I don't think discussion has taken place yet.

. . . . There is a need, in NS / EP, for more coordination than is taking place. People are working on it. There is a long way to go to reach the degree of sophistication required to handle a big emergency, but the fundamentals are there. The immediate major hurdle is who's going to pay, and how.

Where We Go from Here

. . . . Industry has got to work on the kind and quality of information that is provided to state regulators. When that information becomes better, we may well get more consistent regulation across jurisdictions.

. . . . There is an element of the ISDN related to providing access and a stable interface that can proceed independently of some of the international intrigue and other higher-level issues. That ought to proceed.

. . . . What can we do to speed up the standards-setting process? Perhaps look at the processes that are employed by standards-setting bodies to see if there are ways to make the process flow more quickly. It needs to be done by someone who has independence and objectivity, and the pipeline to communicate the findings.

. . . . If we don't find a way to agree on at least some interface standards, there will be a tremendous lost opportunity.

. . . . With respect to end-to-end diagnostics, I hope that Tony will not have to be the one to convene another get-together. On a bilateral basis, in many cases, the job is being done.

. . . . If an industry session is needed, the timing should be as soon as the data is at hand to show the shape and size of the problem. Does the mechanism exist to call such a meeting? A proposal has been made.

. . . . There is a need to stimulate people, to formulate and communicate to regulators and legislators what their objectives might be.

. . . . Access charges are only a means to getting to some end; and what is the end?

. . . . The telecommunications world has had so many certainties, for so long, that everybody expects a level of certainty that simply does not exist in most of the rest of the business world.

APPENDIX C

Antitrust Primer

Introduction

At the luncheon session of the Workshop, Philip E. Areeda, Langdell Professor of Law, Harvard University, addressed the group on the subject of "Antitrust Limitations and Practical Approaches to Industry Coordination." The following is an abstract of his talk, derived from the transcript of the proceedings.

Antitrust Limitations

Not all get-togethers among competitors, indeed not all agreements among competitors, are automatically unlawful. There is much collaboration among competitors which is sometimes lawful -- e.g. agreement on the rotational speed of record players, or on the number of points awarded for a touchdown. Neither are such agreements automatically or always lawful. They are subject to "the rule of reason."

In principle, antitrust law takes account of all the good reasons why any given collaboration should be allowed. In principle, it takes account of marketplace realities as they are. Unfortunately, the translation of these salutary principles into your own reality is very difficult.

With respect to any particular collaboration, antitrust law asks three questions:

1. What might be anti-competitive about it?
2. What are the redeeming virtues?
3. Are there less restrictive alternatives?

The possible forms of coordination are very diverse, ranging from study and talk about a problem, through the development of recommendations, to agreements to act in certain ways in the future. There are also joint ventures, contracts, etc. In general, in all of these forms, there are four things to worry about:

1. The potential for lessening price competition;
2. The potential for reducing the number of choices available to consumers;
3. The potential for inhibiting innovation;

4. The potential for excluding from the market other actual or potential producers.

These problems are difficult for antitrust law to deal with because it is usually so easy to see both the social benefits of the collaboration, at least in principle, and also the possible anti-competitive consequences of the collaboration. Ultimately, a subjective judgment is likely to be required, and that's what makes the application of antitrust law seem ambiguous.

There is a tendency to accept collaboration as intrinsically reasonable where it's necessary for the creation of the product at all. E.g. football games would be impractical without advance agreement on the rules; royalty collection and distribution would be impractical without some collaboration such as is provided by ASCAP.

Some collaborations are obviously necessary to make the network work. E.g. digital voice transmissions would hardly be practical without agreement on the A/D and D/A converter algorithms to be used at each end of a circuit.

Practical Approaches

How can the danger be minimized? There are many useful precautions, of which these are illustrative:

1. Gatherings which include a wide diversity of interests are less suspect than would be those confined to a narrow field.
2. The keeping of a record of what is said is a show of good faith.
3. Be sure in your own mind, before proceeding, that your objectives are honorable with respect to antitrust considerations.
4. Stay as far away as possible from the discussion of prices.
5. Joint investments should be avoided unless the societal good is abundantly clear.
6. Make sure that anyone not present who might prefer a different conclusion has an opportunity to be heard.
7. Minimize the degree of collaboration required to achieve the objective; maximize individual decision-making.
8. Anticipate possible objections, and act to minimize them.
9. Get positive support and participation by government agencies.

10. Seek formal immunity through legislation or a ruling by some government agency empowered to exempt certain kinds of collaboration. (Do not rely upon state agencies for assurances of this kind.)
11. Check out your plans with legal counsel.

