ADAPSO Reunion Workshop: Telecommunications Issues

Moderators:
Joe Markoski and David Allison

Recorded: May 4, 2002
Washington, DC

CHM Reference number: X4588.2008

Table of Contents

ADAPSO Reunion – Telecommunications Issues Workshop

Conducted by Software History Center—Oral History Project

Abstract: A group of former ADAPSO members involved in timesharing and remote processing services companies discussed the characteristics of the telecommunications industry in the 1960s and how it has changed since then. They identified the major telecommunications companies at the time and what the significant issues were in the U.S. and internationally in terms of access to the communications services which they needed. They talked about the relationship between AT&T and ADAPSO and the impact that ADAPSO had on federal regulatory issues. They summarized how the evolution of communications systems, including the creation of the Internet, has significantly changed the pricing structure for both the providers and users of telecommunications; and they discussed security and privacy issues. Finally they concluded by stating that the industry has moved from a monopolistic structure to one that is much more open and available.

Participants:

Name	Affiliation
David Allison	Smithsonian, historian
Tim Bergin	American University, *Annals of the History of Computing*, historian
Joan Krammer	Smithsonian
Joe Markoski	Squire, Sanders & Dempsey
Mike Nugent	EDS
Warner Sinback	General Electric
Dave Sherman	GE Information Services
Bob Weissman	National CSS

Introductions

Joe Markoski: I'm the moderator of this session on telecommunications issues. David Allison is co-moderator. He is from the Smithsonian. And Joan Krammer is rapporteur for the session.

The rules are that you need to identify yourself and your company for the tape, so let me go around the table very quickly so we can state who we are and who we worked for at the relevant periods of time. Again, my name is Joe Markoski. I initially was with Wilkinson, Cragen and Barker and then with Squire, Sanders and Dempsey. From 1976 to 1996, I served as telecommunications counsel to ADAPSO and then ITAA.

Dave Sherman: I was general counsel for GE Information Services during the relevant period. Today, I finally found my calling. I'm retired and do nothing. [*Laughter*]

David Allison: I'm a curator at the Smithsonian.

Tim Bergin: I teach Computer Science at American University and I am the editor-in-chief of the *Annals of the History of Computing*.

Mike Nugent: I had two jobs, actually, during that time. I was staff attorney for ADAPSO for part of that time and then represented Electronic Data Systems on the ADAPSO Telecommunications Committee.

Warner Sinback: During the entire period that we are talking about here, I worked for General Electric. I founded GE Information Services in 1965, which was the first online information service company in the world.

Markoski: The goal of the session is to develop useful information about why the programs that ADAPSO pursued during the relevant period, which in this case is the 1960s, 1970s and 1980s, were important to the member companies. To give us some focus as to what ADAPSO did during the relevant period, I've put together a summary for us to review. Then we can talk about the specific issues as to the who's and why's.

Early Telecommunications Issues

The first thing that struck me, and as evidenced by the small size of this group today, is that telecommunications issues were a very small part of ADAPSO's activities. There were, at any one point in time, only a handful of companies that were actively involved in the committee. I think maybe, in its heyday, you might have had ten companies involved. Within ADAPSO, it was driven by what was first called the Computer Timesharing Section, which was next named the Remote Processing Services Section, and then later renamed the Network-Based Information Services Section. I think it's now called the Internet Commerce and

Communications Division. So it was a small group and it was also not a very popular activity within ADAPSO because it wasn't considered mainstream for the association. One quote that still sticks in my mind is a former ADAPSO President calling it "that big turkey." [*Laughter*]

And also the thing that struck me is that, for the issues we focused on, ADAPSO really was a voice by itself. CCIA was active for awhile but they fell by the wayside. CBEMA was active for awhile but they fell by the wayside. There was an ad hoc users committee but it really didn't focus on the same issues. Every once in awhile we'd have a coincidence of views. So, over the years, it really was ADAPSO that was fighting the battles.

The second thing that came to mind was that, for a small group, the association was very effective. If you think that the Internet is the success of the industry in terms of what it has done and what it has brought, one of the reasons the Internet is the way that it is today is largely because ADAPSO's goal was to keep online services unregulated, and the Internet is unregulated. The Internet is not dominated by any of the phone companies, which was something we were always concerned about—telephone companies extending their monopoly beyond communications. Probably *the* most important thing, based on looking around the world, is that access to the Internet is priced on a flat rate basis in this country. Most other places, it's not, and it hasn't had nearly the penetration it's had in the U.S. ADAPSO spent a lot of time and money on that issue—not flat rate access to the Internet, but the principles that led to it. Both within the United States and elsewhere, we fought the efforts of the telecommunications carriers to replace flat rate private line services with usage-sensitive data services. If we had not had leased lines, there probably would not have been the Internet, at least as we know it now, or it would have been a carrier offering as opposed to what it has become.

One of the reasons I think telecom was never a mainstream activity for ADAPSO is everyone thought it was about the telephone companies. In reality, ADAPSO's telecom activities had nothing to do with telephone companies. ADAPSO's goal was to keep the industry from being regulated. That issue was fought at the FCC in the First, Second and Third Computer Inquiries when the carriers were trying to expand the scope of regulated communications to include a lot of what ADAPSO member companies did. And, as soon as we won that, they came back and opened another FCC proceeding, the Protocol Processing Inquiry, which is basically what Internet access is today. The carriers wanted that regulated, and we successfully fought that. Then the states wanted to regulate information services and we fought a lot of battles with the various states to stop that.

The next issue we pursued was fair competition which was, basically, to keep the telephone companies from cross-subsidizing their competitive computer service offerings, or reserving communications facilities for their services and denying them to other companies. One of the debates I remember was with AT&T, which was an ADAPSO member. The AT&T representative said, "Why are you trying to keep us out of the business?" And Dave Sherman

said, "You're standing on my air hose, that's why." And that's the way we viewed it at that point in time.

Those issues came up in the Computer Inquiries regarding how we could get access to the network when the FCC was developing open-network architecture. When the Bell System was broken up, the issue was the line-of-business restrictions on the Bell companies, and what ultimately became the Telecommunications Act in 1996, which actually started in 1976. That was a twenty-year endeavor to enact that legislation.

We preserved not only cost-based leased lines, but also cost-based local access, because one of the things that the telephone industry as a whole wanted to do was to make information service providers buy facilities by the minute. And if you paid for facilities by the minute, it would either kill the demand for services or just make it so much more expensive that purchasers would reach the limit of their willingness to spend money.

With Phil Onstad of Control Data Corporation, the people from GE, and others, we fought efforts by foreign incumbent monopoly telephone companies to eliminate international leased lines which they saw as a threat to their revenue. The Germans went so far as to say, I think this was to GE, that they had to terminate their leased line in a single computer in Germany and do all their data processing in Germany. Which was a fairly transparent restriction on the efforts of US companies to do business over there. And we fought those kinds of actions with all of the carriers around the world.

We were dealing with essentially the same issues over and over again—sometimes concurrently, sometimes not. It was a situation in which the same issue would show up in multiple FCC proceedings and it was, in one sense, a war of attrition. We had to go toe-to-toe with the telephone industry. If we didn't, we were going to lose. So it really wasn't, in the view of the member companies, an optional policy exercise. If we didn't do it, we'd be regulated, we'd be paying usage-sensitive prices, or whatever the various threats were. So that's some background on what ADAPSO was doing on these issues.

We've been asked to identify which ADAPSO companies were in the lead on these issues for future researchers who want to check them out.

ADAPSO Remote Processing Services Companies

Sherman: Well, that relates back to the question of where did the RPSS/NBIS group fit within the larger organization of ADAPSO. The vast majority of the member companies of ADAPSO were small companies. The big companies that paid the bulk of the dues to the organization became members of ADAPSO because they were interested in these competitive and regulatory issues that most of the rest of the organization cared very little about. Many of

the other companies were members for the purpose of cross-fertilization, making deals among themselves, having an excuse to go on a tax-subsidized vacation to attend management conferences, etc. They had no interest at all in these regulatory issues but they needed us because we paid the bulk of the dues. We represented the major companies: AT&T, GE, IBM, EDS, CDC, Tymshare.

Nugent: These were the companies that used the phone lines to deliver products and services to customers versus the smaller companies which were developing software.

Sherman: We were a very small percentage of the ADAPSO member companies. There were about six different sections of ADAPSO as I recall. Ours was probably the smallest section in terms of membership. But, we probably paid about 80% of the dues and supported the operations of the organization.

Allison: You mentioned some of the companies, but it would be useful to note which were the real leaders in that section.

Markoski: I have a list here of companies that at various times had different roles: ADP represented by Fred Lafer and Joe Gallo. AT&T. Boeing, through Boeing Computer Services. Control Data Corporation represented by Phil Onstad, Steve Beach and Bill Warner. Comshare was one of the leading forces of the telecommunications activity in the early 1970s, represented by Rick Crandall and John Duffendack. Computer Sciences Corporation, when they had a network; Roger Allen was its representative. EDS: Nugent, Jeff Heller, John Lynn. Fujitsu kind of came in and out. They never really got active. GE: Sherman and Sinback. Honeywell came in for awhile: Helen Golding. IBM: Maryanne Angel. Bill Warner also represented IBM at a later point. National Data Corporation: George Shea, Mike Ingram. Bob Weissman has just joined us. His old company National CSS, represented by Les Srager used to participate in these activities. Reynolds & Reynolds popped in for awhile with Ronald Harwith. Sperry Univac. Tymshare with Tom O'Rourke, Warren Burton, Joanne Couche, Warren Prince.

Nugent: Lance Swann.

Markoski: Lance Swann was with CSC. Xerox Computer Services came in. But, I think the ones that were the most active probably would have been ADP, AT&T, Boeing, CDC, EDS, GE, IBM, and National Data. Tymshare at one point was extraordinarily active, so it varied over time.

Nugent: As some of the access rate issues came up, smaller companies that were dependent on the phone line to deliver services were worried about the rates going up, or they were worried about the ability to interconnect to particular users, so they joined with the large companies in ADAPSO.

Weissman: As you recall in the 1970s, one of the major issues was the Bell System's effort to expand the use of message units because of the impact that would have on the cost of communications. I remember that as a big issue.

Sinback: When they saw the potential impact on their costs, the little companies got interested and then as soon as that issue was settled they went away.

Markoski: That really was a problem within ADAPSO because when ADAPSO was dealing with the banking industry disputes, a lot of service bureaus were affected, and you could get those smaller companies involved. Bernie Goldstein mentioned in this morning's session on banking litigation that the insurance agents could hit a button and get ten thousand people calling Capitol Hill screaming about the banks and insurance. ADAPSO never could do that because it didn't have the numbers and, except for the issue that was just raised with respect to access charges becoming usage-sensitive, these issues didn't affect that many people. So the one thing that we could never do was to have Capitol Hill bombarded with phone calls from angry constituents.

Sinback: The one time that we really surprised the FCC, we loaded their mail baskets with stuff for the better part of two weeks. We inundated them when the issue came up of paying usage-senstive charges for access. There were enough people whose ox was going to be gored by that ruling that we were able to get a large group to respond and it made a hell of an impression.

International Telecommunications Issues

Weissman: Another area where it was hard to get traction because of the narrow scope of the interest group was issues being created out of CCITT. There were a relatively small number of ADAPSO member companies, less than five or six as I recall, who had global packet networks and were very interested in what was happening at CCITT. Phil Onstad was, in effect, the de facto representative of ADAPSO at CCITT because he went on behalf of Control Data, but he would report back to us what was going on and what was on their agenda.

Sinback: It was the nearest thing to an international regulatory body for telecommunications.

Markoski: We started that battle in 1976. As each one of our companies wanted to go to Hong Kong or Singapore or Germany or Japan or the UK, either the incumbent phone company in the other country, or the US international long-distance carriers, did what they could to try and get rid of leased lines. They wanted us all to move on to their usage-sensitive services.

Sinback: Well, they maintained the right covered in their usage contract to control the usage to which a telephone circuit was put. If it was anything other than voice they immediately raised objections. And so we had to fight for these companies. We fought in the international body which was CCITT, but then we also had to fight this individually with the countries. I spent thousands and thousands of hours fighting with Japan, China, Singapore, and Taiwan. I could run down a list of fifty countries and each one of them was an individual battle and in some of them we had to go to great lengths. The PTT's in most countries were responsible for postal service as well as for telecom service, so the minute email showed its face, they had a very strong interest based on their responsibility for the mail. In Belgium, for example, we had to finally go to the European court and file a complaint against the Belgians to permit us to use the telephone circuits in Belgium for electronic mail. And we won the case. They were admonished by the European court and instructed that they were to make the circuits available for us. But that wasn't the only case. In Singapore, we had a running battle for several years before we finally won. Hong Kong was another one that we fought for at least two years.

Sherman: Italy as well.

Sinback: The Italian government was a pain in the neck.

Markoski: The Italian government actually adopted a rule that would get rid of leased lines or make the price usage-sensitive. So it wasn't a subterfuge of moving us from one service to another. They actually wanted the international regulatory system changed.

US Telecommunications Issues

Sinback: The battle that we had in the United States with AT&T was really replicated many times internationally and, of course, it was not a simple thing to win against AT&T. Their original approach to the use of their circuits was the same as the international people. They said, "You can't use our circuits for that, it's just not permissible." Well, the question is, what *is* permissible then?

When we first started timesharing in 1965, the telephone companies were amazed. The first one was Mountain States Telephone in Phoenix. Our usage of the circuits constituted what they felt was a threat to the way they managed telecommunications. If they had a hundred ordinary subscribers for telephone service, they configured their central office in a way that was based on the probability of how many people of that hundred would call at the same time and based on an average holding time between one and two minutes. It was actually 1.45 minutes. So this meant that they could configure their central office to handle twenty simultaneous calls with no problems.

Well, when timesharing came along, people signed on from a terminal through an acoustic coupler and they would stay on for an hour and a half. All of a sudden all of the calculations that the telephone company used to manage the process were thrown out because they had to now take into account this added kind of service. For example, we brought our very first system up on Labor Day of 1965. We had worked with Mountain States Telephone Company for the better part of two months, trying to explain to their engineers what was going to happen. They looked at us and said, "We know how to run this thing so you guys stop trying to tell us what to do." We had our computer center right in the center of Phoenix and the day we brought our system up we pretty much destroyed business communications in the middle of Phoenix for a whole morning. And they suddenly realized that what we were talking about really was something that was different from what they did before.

So AT&T, through Bell Labs, developed something that I believe they called a timesharing assembly. When we came to them for the second system, which we put in Schenectady, New York, they configured the New York Telephone offices there to handle it. Then we installed systems in a number of cities.

Nugent: That was when AT&T controlled local and long distance service.

Sinback: That's right. But the interesting thing was the marketing people at AT&T now sat back and said, "They're using our system for free, and they're making money off our system. So how do we get at them?"

The first case, I believe, was in Kentucky. They filed a tariff with the state regulatory body in Kentucky for what they called a timesharing assembly. Business lines at that time were costing us about fifteen dollars a month average across the country. This timesharing assembly tariff raised that price to about sixty dollars a month per line—an enormous increase. Well, AT&T was everywhere in the U.S. and we knew if it happened one place, it was going to happen all over. So we appealed to the regulatory body in the State of Kentucky to overturn this ruling and lost. The only step left for us was to go to court which we did and we won.

Sherman: That wasn't ADAPSO, that was GE.

Sinback: That was GE but this is all tied in with the movement in ADAPSO to follow these issues. Subsequently, they tried in several other states and lost and, finally, the whole thing sort of fell by its own weight.

Markoski: If you were to look back at these issues, which do you think would be the most significant ones that we were involved in?

Sinback: Well, that's certainly one. We would never have developed the industry if AT&T had succeeded in what they were doing because the economics were not there.

Weissman: There was another issue related to AT&T. In the mid-1970s, AT&T developed and began to license UNIX. Part of the history of ADAPSO was coalescing forces to deal with 800-pound gorillas like the banks and IBM. Now AT&T showed up as a potential serious competitor on the software side. Obviously, that effort never really developed into a full-fledged software business but there were a lot of cycles burned within ADAPSO during that period.

AT&T and ADAPSO

Nugent: Because they wanted to offer that software to the public at rates that were pretty cheap. It raised the whole question of AT&T, the phone company, offering computer services and software using a rate payer funded subsidy to do that.

Weissman: I think that what happened was that the AT&T got diverted. First in defending itself against, and then dealing with the inevitability of, the break-up, and the focus just shifted. The opportunity, if there was one there for AT&T, was lost.

Markoski: One of the things we talked about at the banking session this morning which really ties in with this, was that the ADAPSO approach was pretty much uniform across all of these debates or fights. The argument never was that the phone companies shouldn't be in the timesharing business or shouldn't be in the remote processing business. It was that, if they were in the business, they couldn't unfairly exploit their monopoly, or buy their facilities wholesale when we had to buy them retail for the underlying transmissions.

Sinback: A level playing field.

Markoski: Just give me a level playing field to compete on.

Allison: AT&T was there in the ADAPSO debates?

Markoski: Yes, they were.

Allison: How did that factor in? Was there a debate within ADAPSO? Did ADAPSO go out with a unified voice or how did they state their position?

Markoski: Let's see if we can pinpoint when they joined. I think it was before the breakup.

Weissman: It was in the mid-1970s, I think.

Markoski: Okay, mid-1970s, so things were fairly contentious then.

Sinback: Well, their first thought, I feel reasonably sure, was that they would come in and change the position of ADAPSO. In the Telecom Committee, for example, their first representatives were very contentious. I'll give you one example. Our policy in ADAPSO always was: when the committee makes up its mind and takes a position, it's everybody's position. There are no minority votes. So the first time a contentious issue came up after they joined the committee, they said, "Well, fine, we understand the position you've taken. But as a paying member, we want a footnote that says AT&T did not concur with this." I was chairman of the committee at the time and I refused. I was asked what my authority was to refuse it, and I said, "Well, it's in the bylaws that we've adopted that this is the way that we operate." The reason that we adopted this, by the way, was that CBEMA had been paralyzed by that kind of maneuver and I think that's why AT&T thought it would succeed. So they said, "Well, we don't buy that rule. We want to take this to the Board of Directors of ADAPSO." They did. And they lost.

Sherman: Not without a hell of a fight.

Sinback: Oh, it was a hell of a fight.

Sherman: Because AT&T paid a disproportionately large amount of membership dues, and a lot of the other member companies within ADAPSO who weren't interested in these issues were trying to…

Weissman: Keep them in the tent; keep the dues in the tent.

Sherman: Exactly.

Weissman: Talk just a moment about the sociology of that. I don't remember what the date was but it was at a conference in Hawaii. I set up a meeting between the rep from AT&T and Ed Kane, who at that time was the representative from IBM. I'd spoken to Ed and said, "This guy doesn't know how to deal with this trade association. We would like to keep him here but he's going to need to understand how it works. I would appreciate it if you privately just explained to him how a big company does it successfully." That effort failed. [*Laughter*] Ed failed. I failed. But we made an effort to try to get them to adjust their perspective. As Warner said, it was very clear to us early on that they were coming in with the view that they would become the 800-pound gorilla and that their dues would allow them to shape the agenda and the decisions.

[Ed. Note: The conference referred to took place in October, 1980.]

Sinback: Which they had been successfully doing in other places.

Allison: And so, for the record, how did it finally play out?

Markoski: What ultimately happened is they accepted the rule that there were no footnotes. They would argue like hell about their position but they figured out after awhile that there were certain things that we just weren't going to back off on. We weren't going to back off on no regulation of computer services. We weren't going to back off the requirement that they had to enter the industry through a separate subsidiary. But on the margin they could keep us from being gratuitously insulting, which we were sometimes known for. [*Laughter*]

Sherman: It wasn't gratuitous. [*Lots of laughter*]

Markoski: And there were things, on the margin, that were really important for them that were not important to the other members. I think that the way it really started working is that they replaced the representative. They sent a nice guy, Bob Lejeune, and we always tried to let him go home with something. He could always go back and say, "You know, they were going to do such-and-such and I persuaded them not to."

Allison: So they stayed and continued to pay the high dues, the whole bit.

Various voices: Yes, yes.

Allison: And worked the margins and felt like even just doing that was valuable to them.

Markoski: Then once the Bell System was divided, they were on the same side of the fence as everybody else because they were facing competition in the long distance business. I mean, perspective is everything. They actually found it to be a very good vehicle for them to get their agenda pressed when they didn't want it to be just another AT&T issue. They could hide behind ADAPSO as all member companies did. You don't always want to be in the front. So it really did work out pretty well.

The Impact of MCI

Allison: Did MCI come into the business, have any impact on this?

Sinback: MCI was very active at one point in the committee.

Nugent: Bill McGowan.

Sinback: McGowan had very strong views on competition in long distance but they weren't in this business. They weren't in the value-added service business at that point so they didn't have the real incentive to do as much as the others.

Nugent: Their primary competition with AT&T was not in voice transmission, it was in the private data transmission business.

Sinback: They were interested in the regulatory side of the thing rather than permission for value-added services.

Markoski: If you look at the pictures out in the hallway, you'll see there are a lot of pictures of congressional testimony. Nine out of ten of those testimony or congressional hearings were on telecommunications issues. There's one up there with Steve Beach and Bill McGowan, the founder of MCI. There's another one up there with representatives of manufacturers and competitive long distance carriers. ADAPSO worked very closely with similarly situated organizations in other industries, the competitive telephone industry, for example.

ADAPSO's Influence on Congress and the FCC

Allison: We heard this morning that, on the banking issue, ADAPSO had some pretty important friends on the hill, particularly on the House side. How did Congress respond? Did they take positions on this? Were there different congressmen with different positions?

Sinback: We had some pretty important friends up there on the telecom regulatory side also.

Markoski: Ed Markey from Massachusetts.

Sinback: The congressman from California who lost his job

Markoski: That's where I cut my teeth in the Congress. He brought me in like a lamb to slaughter.

Sherman: Lionel Van Deerlin.

Bergin: Who were your enemies? What members of Congress did you consider to be on the other side of the fence from you? If these were your friends, who were your enemies? Anybody in particular?

Nugent: I wouldn't say ADAPSO had any particular enemies who targeted us. We were not that big a target.

Markoski: The Telecom Act of 1996 started in 1976 and that's when AT&T was pushing the Bell Bill to end the antitrust lawsuit. It was in 1981, I think, when ADAPSO really got active because that is when Ed Markey was a freshman, Congressman Matsui was a freshman, and a couple of other freshmen…

Sherman: A lot of our battles weren't fought in Congress but at the regulatory level with the FCC. I think probably more of our efforts were involved with the FCC than with legislation.

Allison: And was the Commission more evenly split? Did you have to work with individual members?

Sinback: We had to work with individual members, basically. Congress, I don't think, was ever heavy-handed in either direction. The one policy position the FCC took way back was that competition, if it was available, should replace regulation. That was a basic policy that they followed and still are following, for that matter. That was a real change when they adopted that. Who was the chairman of the commission?

Markoski: Ferris.

Sinback: Ferris was the guy. They had monthly breakfasts where the heads of various regulatory agencies got together and Ferris was the guy who came to that group with the idea that things that had been regarded as a necessary monopoly because of their configuration and the economics and so forth, maybe no longer qualified, that competition may be possible and they should think about this.

Nugent: Fowler was the Chairman during the whole debate about what is regulated and what isn't. They were trying to bring into the regulated sphere certain things that were closely related to data processing. I would say that Fowler was the worst of all of those guys, don't you think?

Markoski: Probably.

Nugent: Probably the most antagonistic.

Sinback: Yes, he was, but that policy shift in the FCC is what really led to deregulation and the break-up of AT&T and so forth.

Other Companies Involved in Regulatory Issues

Allison: Who were the major players in these policy debates other than ADAPSO and the other trade associations you mentioned earlier? Did individual companies participate? Were there coalitions?

Sinback: There wasn't tremendous participation from big companies. There were half a dozen.

Nugent: GTE Telenet was there.

Markoski: Generally the way it lined up was: you had the interexchange carriers pretty much as a block; the Bell Companies and the local exchange carriers were a block; and the large users tended to operate together. There weren't too many information service provider organizations. Those companies were basically represented by ADAPSO. If it was really important, an individual company might participate. IBM always participated but they were flush with money. They participated in ADAPSO, but they were also there on their own on specific issues.

But, yes, we always tried to align ourselves with other people or, at least get other people to not unnecessarily trip over our toes, because what is regulated and unregulated is a very technical issue. It didn't look like a big deal but, if we had lost that battle, Internet access would be regulated telephone service today. The issue was whether what goes in looks like what comes out. If there was any change in it, it was on our side of the line, and if it was just a pure pipe, it was on the telephone company side of the line. Once you got pregnant by blurring that, you lost.

So we would fight all that stuff tooth and nail. That was what Mike was referring to. Fowler, during this period, wanted to let the phone companies into this business because it was high tech. The phone companies didn't want to offer it on an unregulated basis because then they couldn't subsidize it. They wanted it to be regulated. So there really were some very fundamental disagreements about how the world should look.

Sinback: But these simple tests were very useful because, if you looked at a bit stream going in and coming out, it was very easy to argue with the telephone company whether it was exactly the same at the end of the transmission. Has it changed in any way? And if it has, it's value-added, so therefore you can't regulate it.

Sherman: We made that argument over and over and over again on every floor we could imagine.

Internet Issues

Nugent: If the Internet had been treated like a regulated service, it would have meant that only those who were common carriers could provide it, which would have made for a profoundly different Internet.

Sinback: Well, the Internet would never really have happened.

Markoski: From my perspective, and I suppose that of the historians, the irony is that the people who I think benefited the most from the Internet were software people, who were the ones who had the least interest in all of these issues at the time.

Bergin: How did they benefit more than others?

Markoski: My view is that if the Internet didn't exist, people wouldn't be using PC's the way that they are using them now because they'd be just stand-alone computing devices. But with the Internet, people are buying every software application you can think of and going online with it.

Sherman: It created a larger market.

Bergin: Yes, but I'm not following the logic. I'm not disagreeing, I'm just not following the logic because the people who jumped on the Internet early were using freeware. Netscape was free.

Weissman: I don't know if I'm saying what Joe is saying but I think that what the Internet did was to change the computing network topology. The fact of the Internet created a communications capability which companies have made use of by building software which allows that communications component to become a fundamental part of the computing environment. If that component wasn't there, it would still be like the topology of the 1970s and 1980s with data here and customers there and lines in between. Software was what enabled the change to happen and software has also taken advantage of its existence. The whole enterprise software market would not have developed as it has if that topology wasn't available. Software companies couldn't build it because they don't have the capital to do it. But they have taken advantage of its existence. Building extranets and VPNs and everything else that came out of that change in communications has enabled these markets to form.

Bergin: I would still disagree, because up through 1993, 1994 most global corporations had very robust networks whether they built them or leased them or put them together in various and sundry ways. If you're talking about the explosion of every Tom, Dick and Harry getting on there and doing email on the Internet, that has nothing to do with software companies.

Weissman: During that period I was running Dun & Bradstreet, which had a very robust global network with tens of thousands of online customers. The economics of that kind of structure was very different than what is available today. There were major markets and major market segments where you could not justify the infrastructure costs to deliver online. So, yes, there were high-speed lines running data to a customer like General Motors and you squirt data down to him and back and forth. But the guy at the other end of the spectrum, the other end of the market space, didn't have a PC, didn't have an Internet, didn't have a private network connection and couldn't afford to put one in. That's the economics that changed. Whether the Internet resulted from that, or the Internet caused that infrastructure to go in with all the problems in telecommunications today as a result, it's there. And it has enabled these companies to expand, in addition to all those dot-coms who said, "I'm going to take advantage of its existence and try to do something with it."

Sinback: There is a principle in the Internet that is probably the most important principle and that is the packet-switched network. The comparison between that technology and the ordinary leased line technology that Weissman was just talking about is *phenomenal* in terms of the economics. It's hundreds of times more efficient cost-wise to have the packet-switched technology. So that technology in the Internet became a great facilitator for a lot of things, one of which is the software side. There are many others.

Public Packet Networks

Weissman: When public packet networks became a real part of the market, which was the early 1980s as I recall...

Markoski: Telenet.

Weissman: Telenet, right. The market price per hour of a 1200 baud connection, whatever was the standard at that time, was in the four to six dollar-an-hour range. Okay? Now compare that with the effective cost per hour for a 28K, 56K connection on the Internet. It is at least one order of magnitude cheaper, maybe two orders of magnitude. It changes the economics of lots of services hugely.

Bergin: Does it follow that corporations like Dun & Bradstreet have then abandoned their private networks?

Weissman: In 1994, I sold the global packet network of Dun & Bradstreet to Eunetcom which was a consortium of the German and the French PTTs, because tariffs had changed and there was the availability of other technologies which made it cheaper for us to get reliable service in other ways. Eunetcom bought it because they wanted to get into the global data communications business but they didn't want our backbone of Tandem computers. They

wanted the 400 or 500 people we had employed around the world servicing that network so that they could get into a new service area.

Bergin: So they bought the experience and the knowledge that came with it.

Weissman: Exactly.

Markoski: IBM got rid of its network. GE's gotten rid of its network.

Pricing Changes

Sinback: If you look back at the beginning of the period we are talking about, the early 1960s, and you compare the cost of communications per bit, and compare that to today, the difference is just *phenomenal*. The cost of communication has fallen to the point where today, in many applications, it's trivial. It's in the rounding error. Whereas back in the early time I'm talking about, it was an enormous part. When we first started out with our information service, the cost of telecommunications was 30% or 40% of the cost of the service.

Weissman: To put that in absolute terms, at National CSS in 1973, CPU, storage, I/O, and connect were all charged separately to a timesharing user. My recollection is that we got twenty dollars an hour for connect and, in 1973, that was 300 baud, with an acoustical coupler. Twenty bucks an hour. In 1973 dollars.

Allison: Let me push a little bit on Joe's assumption that if the regulatory battle hadn't been won, things would have a different pattern. Do you think that there is no other model? Assuming that you'd lost that case, would AT&T have continued to hold up its prices? Were there no other innovations or other pressures on them that would have provided another path to get some of the innovations that came in later such as packet-switching?

Markoski: I think you have to identify whether you're talking about it being regulated or unregulated, or about flat rate pricing. I think you have to separate the issues because I can come up with a different answer depending on which one you're talking about.

Allison: I was thinking about the regulated/unregulated issue.

Markoski: Okay. Let's think out loud. If you were at the Bell System, and could offer the Internet or you could keep on selling leased lines and dial-up at twice the cost and no one else could offer the Internet, would you have introduced it? Why did the Bell System have black telephones for so long?

Weissman: Let's move forward to the current day. Take a look at the people who control the local loop today. If there is a consensus among the pundits and the forecasters, it is that what is required is broadband connectivity. It drove a lot of people to over-invest and it's caused a few bankruptcies here and there, but it hasn't changed the message that for the future we must have broadband. Now, contrast that with the local loop providers' response to DSL, which is certainly not brand new.

Markoski: Over-priced.

Weissman: It is consistently overpriced, underserviced.

Markoski: Quirky.

Bergin: And largely unavailable.

Nugent: And look how they are still trying to put access charges on it.

Weissman: In an environment where people are saying, "If you build it they will come." There *is* a demand for broadband.

Changes in the Telecommunications Industry

Allison: Do you think they will finally be challenged by wireless instead of the normal way of opening up competition?

Weissman: Well I'm an old RF engineer so I really don't want to get started on that. [*Laughter*] I think they will be challenged by other technologies. Certainly they *are* being challenged today. When you look at the number of installs of DSL versus the number of installs of cable modems, cable has been much more aggressive in capturing that market.

Sinback: But going back to one of the earlier points. If you assume that deregulation had not occurred and everything stayed the same, as a monopoly, the idea of competing with that was just economically impossible. The cost of the installed base to compete was just absolutely prohibitive. It just never would have happened.

Allison: That's really the early MCI story, isn't it?

Sinback: It is. And, as Bob said, these people are still acting exactly like monopolists even though they're deregulated.

They're out here digging up the streets. You can't get anywhere in Virginia now because Verizon is in the way digging holes in the street to put down these huge fiber optic cables for which there is no market. It's sad, because what they've been accustomed to is: if you put it in the ground it's going to provide an enormous return on investment. That's no longer true and so it's really turned the whole industry on its head. Except that they don't realize yet that they are on their head, which is just as sad as can be.

For example, one of the things that was available to the telephone companies very early on, even before AT&T was broken up, was that it was possible to transmit at least 50 kilobits and maybe 100 kilobits on the twisted pair wires that come into your house. And yet they never exploited that and they had the pairs coming into every house. All they had to do was to exploit it. Today, DSL really doesn't offer a hell of a lot more than a twisted pair. And yet, it's fifty dollars a month. Amazing story.

Nugent: I'd like to make a couple of points on the international side. ADAPSO, through Control Data's Phil Onstad, was very active in fighting for the right of its members to terminate our lines in our own premises overseas, and not have to terminate them in the central office of the phone company over there. That was a big deal because if you terminated at the phone company, you would then have to get a big line to get to your facilities. Warner talked about there being a restriction on what you could actually send over the lines in other countries, such as electronic mail. You couldn't even get private satellite service. So if you were in India and needed to get from point A to point B and the phone company wasn't doing it for you, you couldn't even set up your private satellite system. So ADAPSO, through various filings through various members, spent a lot of time in the international arena fighting for user rights regarding access to and use of telecom lines and service.

Weissman: There was another issue that we dealt with in the late 1970s and early 1980s. People began to talk about networking as more than connecting big mainframes down a leased line. That meant talking about distributed computing which raised the issue of co-location, of getting the right to place processors within the network, if you will. That was successfully resisted by AT&T and by the individual phone companies and the industry moved on and has dealt with that topology question in other ways. That was another case where ADAPSO spent its energy trying to cause some change. And again, that was another case where the only members within ADAPSO who were concerned were the biggest companies. And even those companies didn't really have quite the passion needed to pursue it because none of us had business plans ready to go. We could just see this as a future potential which we would use if it was available, but it wasn't as though we were going to die if we didn't have it. Certainly the software companies and the professional services companies couldn't have cared less.

International Relations and CCITT

Allison: I'm going to ask you guys a somewhat oddball question. I've often thought that the Internet and the whole international telecommunications structure developed the way that it did in significant part because of the relatively peaceful nature, at least in the Western world, of this time period. Do you think if it had been a different situation in terms of international tension and political strife that this would have been a very different kind of picture? Or do you think technology would have played out the same?

Weissman: I'm sitting here trying to think of evidence of it being different and I'm not coming up with anything. Certainly the relationship between the United States and Europe was good during this period. But it wasn't good with everybody. It wasn't good with the Eastern Bloc, it wasn't good with Russia. It wasn't good with China.

Allison: The pattern in Russia and China, weren't they significantly different?

Weissman: Well, if you want to talk about the infrastructure within a country, yes, I think we can certainly say they're different. But I thought you were asking about the global connect piece.

Allison: Yes, that's right

Weissman: I don't think the global connection was materially affected by those differences.

Nugent: And you had CCITT which is a body of the U.N. and they typically meet no matter what.

Sinback: A hundred and twenty countries.

Nugent: It's even more now. I think it's a hundred and sixty now. The CCITT meets for weeks at a time, made up as it is of professional phone company representatives and government representatives. They discuss these issues and they fight these battles. It's the same issues. The CCITT will come up with recommendations which then tend to get baked into the laws or the practices of the various countries. So these issues of co-location and usage of leased lines and termination of leased lines and pricing were fought out there at the CCITT.

Weissman: They are kind of supernational but they are like the conferences held every four or five years to deal with spectrum issues, where there are some rules of conduct, if you will.

Allison: We tend to think about politics shifting technology but it's really technology shifting politics. I mean in the sense that some of the advantages that come out of this willingness to cooperate and put politics aside, eventually that turns around and shakes the politics of the country.

Sinback: I don't think there is any doubt that the telecommunications revolution affected the fall of the Soviet Union in a big way, a *huge* way.

Allison: Yes, and changing China, too.

Sherman: How about access to global applications? You had potential users in Russia, for instance, but you didn't have a network access point in Russia because you couldn't provide one there. Those users in Russia would have to get access through their own means to your service, someplace where you did have a network access point, perhaps in Finland, for instance. They found ways of getting to the service, but you were doing the service in Finland, not in Russia.

Weissman: And in Austria, and in Germany.

Sinback: As a matter of fact, we did a survey one time. We had footprints in our network for every user that came in and all we had to do was go back and dig through the data to find them. And long before the Soviet Union fell, we found that we had *a hell of a lot* of users coming in from Finland. And we didn't offer service in Finland. [*Laughter*] And they were regular users. These were people that came in two or three days a week, every week, and it's obvious that they had made an arrangement of some kind. In all the peripheral countries, we had users that were finding their way to our service.

Weissman: If you recall, during those years the Soviet government was still establishing five-year plans for hardware processors. They were trying to build their own processors and it was not politically correct to use an IBM processor or a GE processor and yet the Russian computers didn't work very well. So scientists and software people in those countries got creative.

Privacy and Security Issues

Markoski: One thing I want to mention is privacy. The privacy battles of ADAPSO began almost twenty years ago. A lot of the issues being fought now were actually articulated back then. And the reason is because the European Data Protection Directive was floated in the mid-1970s and this group, through Phil Onstad, saw the way it was worded as a real threat to the flow of international commerce. Invisible barriers to invisible trade, it was called. There would be requirements in the name of privacy that we had to process data within a country; we couldn't process it in the US.

Weissman: In fact, in the early 1980s, the Bundespost put out a directive which said that personal data and other kinds of data, could not be processed outside the country. So you

could not communicate that data online. You delivered a tape to the German border and handed it to somebody who would take it so it could be processed.

Nugent: And this was in the name of privacy.

Weissman: Yes, in the name of privacy.

Sherman: It was a question of where you could store the data.

Weissman: CDC had a problem with the Swedish government.

Markoski: The Swedes always used to say that the plans for the fire alarms in Malmö, Sweden were kept in a computer in Cleveland, Ohio, because they subscribed to Control Data's service. And they said that that was wrong.

Sherman: That wasn't a privacy issue; that was a security issue.

Markoski: That was a security issue, yes.

Sinback: What happened is a funny story. A reporter was going to do a feature story on fire fighting and went to a fire station in Malmö, Sweden. While he was there working on his story, an alarm came in and he was very interested to see how they responded. A bunch of them ran and got their helmets and equipment, but one guy ran to a teletype terminal and furiously typed something in and then tore off a piece of paper and jumped on the fire truck and out it went. So when they came back, the reporter said, "I'm really terribly curious. I noticed you rushed over to this terminal and you typed and then you took the paper that was printed out." "Oh," the guy said, "those were the directions to the house where the alarm came from, how to get there, you know, directions, street by street." And the reporter said, "Well, where is the computer that's connected to?" "Oh," he says, "we have this service in the United States in a place called Brook Park, Ohio." [*Laughter*] So the guy wrote up the story and one of the Ministers in Sweden read this and said, "Oh my god, our fire fighting is all dependent on some computer in Cleveland, Ohio?"

Nugent: One of the other privacy issues that ADAPSO was involved with was the update of the wiretap laws for the digital world. What are the laws governing interception of electronic data? What are the laws governing access to stored data? What happens when law enforcement wants to go in and get data? The rules in existence applied to the old voice transmission world but not to the data transmission world. ADAPSO really spent a lot of time with others, including the ACLU and a hodgepodge of what you think would be atypical interest groups, to help update the wiretap laws in the digital world. So that was another example of privacy issues being dealt with first at ADAPSO by this group.

Sinback: We had to make sure they didn't word it so broadly that it would put us out of business.

Bergin: If someone were trying to learn about issues that we've been discussing this last hour and a half, are there any references that you could provide?

Weissman: Those 25 volumes that Luanne Johnson referred to in her talk last night that contain Milt Wessel's files, I would assume are fairly comprehensive.

[*Ed. Note: An announcement was made the previous evening that these files were being donated to the archives at the Charles Babbage Institute.*]

Bergin: Yes, but I meant something condensed somewhere.

Markoski: Well, on the international issues, yes, because these guys helped me write a law review article on the international issues. It's in the Cornell *International Law Journal*, and summarized all the international leased-line battles and the restrictions. On the domestic battles…

Sinback: I've never seen anything.

Markoski: There is a textbook with the laws but it doesn't give you the dynamics.

Nugent: I don't think anyone has ever had the time to write about it.

Bergin: Which is what I guess has got to happen. Somebody's got to sit down and write some of this because no one is going to go out to CBI and go through 25 boxes.

Markoski: And the reality is that a lot of the people involved are dead.

Weissman: I think the answer is you've got to find an eager young doctoral candidate who is looking for a thesis subject and give him those 25 volumes.

Sherman: With respect to things like the amendment to the wire tap law, there is legislative history and committee reports that are available.

Sinback: And congressional testimony.

Allison: Yes, congressional testimony.

Bergin: But I was just hoping that there was a nice article somewhere that explains a lot of this.

Markoski: One of the things ADAPSO used to do was get some Congressman to hold a hearing on these issues because those hearings are published. We'd use it as a platform to air all these problems.

Allison: Actually, a shortcut to archival research, on more subjects than we know, is to go to the records of congressional hearings. It's definitely true on military history, which I used to do a lot of, and I think it's true in this field too. And you go from that back to your original sources. It's still work but not as much.

Weissman: The only weakness with that is the fact that for a long period of time we were really under the radar screen. We were not consistently having congressional hearings.

Allison: I haven't used FCC records. I assume they would exist but I don't know about archival access to them.

Nugent: If you read Computer III for instance, it will take you all through Computer I and II, and it's a real nice history of various efforts.

Weissman: Three is pretty comprehensive. And three really dealt with the telecommunications issues much more heavily than one and two.

Sherman: He's talking about the FCC proceedings called Computer Inquiry I, Computer Inquiry II and Computer Inquiry III. I think no. I was in about 1969.

Weissman: Yes, that was the original one, and the second one was 1973 or something like that, and the third one was 1979.

Summary

Krammer: If I might ask a question. It's been quite fascinating listening to what people have been saying. A hundred years from now, how would you sum up this period of telecom? What would you want people to know?

Weissman: It marked the change from a regulated monopoly to the democratization, if you will, of communications. If you take a look at the telecommunications world today, it is much richer by any measure, not only in terms of bandwidth and function points but competitive mix, access, usability. And a hundred years from now I think that will be the essential point. The rest of this were skirmishes along the way to creating that.

Sherman: Except that we weren't communications providers. We used communications for the purpose of providing the computer-based services that we made available to US businesses, world businesses.

Sinback: And the other major contribution was the technical developments that flowed out of World War II into this stream of movement toward competition and away from regulation. The merger of those two things created a tremendous period of change.

Weissman: Communication science had halcyon years from 1950 forward.

Allison: As we said earlier, that deregulation pattern is still going on, it's not really done.

Weissman: To your question, Joan, if someone goes back a hundred years from now and asks how would you characterize this change in telecommunications, you would say that it moved from a monopoly environment to a much richer environment, in terms of technology, competitiveness, and cost structures. Order of magnitude changes, important ones.

Markoski: Our time is up, thank you everybody.

