

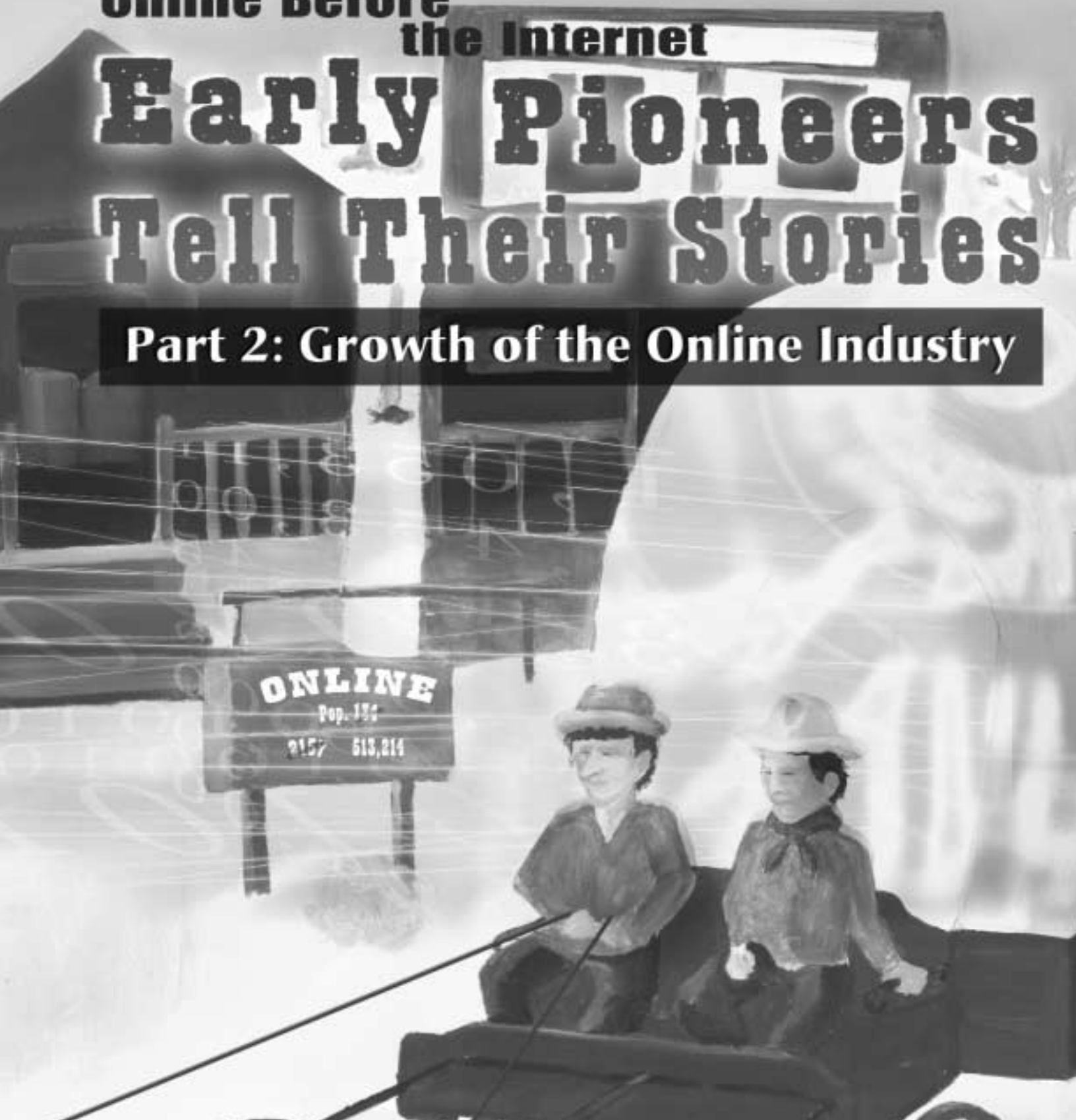
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**Online Before
the Internet**

Early Pioneers Tell Their Stories

Part 2: Growth of the Online Industry



In Part 1 of this series, published in the June 2003 issue of *Searcher*, Roger Summit (Dialog), Carlos Cuadra (ORBIT), and Dick Kollin (Pandex, Magazine Index, Telebase, and EasyNet) described the initiation of the ORBIT Search Service at System Development Corporation, the beginnings of DIALOG at Lockheed, factors that encouraged and discouraged the development of these systems, and the early wave of online. In this segment of "Online Before the Internet," their April 2000 discussion is continued, focusing on the addition of databases, marketing, and building the industry, commercial and government enterprises, and competition. They begin by recalling the role of COSATI in expanding awareness among government agencies of the possibilities of online.

by

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Cuadra: COSATI was the Committee on Scientific and Technical Information.

Summit: In 1968, COSATI invited several online systems to demonstrate to the government, using a segment of the Department of Defense database, called the COSATI Inventory. That was a key milestone in that it constituted a survey of off-the-shelf, interactive data-handling systems of the day. We demonstrated DIALOG, and Dick Giering demonstrated Data Corporation's Data Central System (it later became Mead Data Central and led to LexisNexis). Other systems demonstrated were Computer Corporation of America's Model 103 system and Lucid from System Development Corporation. I actually have a video of the film COSATI produced from these demonstrations.

Cuadra: There was another one called OBAR (Ohio Bar Association).

Summit: OBAR came a little later. At this time, Giering wasn't involved in legal databases. We competed with Data Central for the licensing and offering of Psychological Abstracts and other things — this was later on, but before OBAR.

You say you competed with Mead Data Central for Psychological Abstracts and other databases. Did you also compete against each other for databases?

Summit: I don't remember the SDC conflict or competition as much as I do the Mead. They went for the NTIS database and we went for the NTIS database; we got it. NTIS wouldn't award its database to both because a lot of hand-holding was required. NTIS wanted to have just one contractor. The same thing was true with ERIC. I recall that Data Corporation tried to get ERIC and couldn't, because it was already available on Dialog.

Cuadra: By 1972, ERIC had become available generally.

Summit: Then Data Corporation got Psych Abstracts and offered a service on Psych Abstracts for a while. We took

Psych Abstracts away from them later on because of a requirement Data Central couldn't meet, which led to the invention of our sorting algorithm. Psych Abs wanted to be able to sort records in real time, and Data Central couldn't do that. It was a race for databases.

I remember meeting with a fellow named Bill Knox, the head of NTIS, who complained to me about all these databases we were putting up — maybe three or four at the time!

[Laughter.]

It was almost like a mentoring session. "Roger," he said, "if you don't know what business you're in, you won't be in any business at all."

Bill Knox thought you were being too diverse with the different subjects?

Summit: Yes, too diverse. We had ERIC, we had science, and we had government. That was Knox's advice: "If you don't know what business you're in, you won't be in any business at all. You should pick an area and stick to it." I considered his suggestion, but not for very long. It really was a race to get databases. Each database brought in new customers who in turn used existing databases — kind of a push/pull phenomenon.

You were trying to expand the customer base.

Summit: You bet.

Cuadra: It wasn't as though we were hopping around. The chemistry database was related to the petroleum literature and Petroleum Abstracts. Petroleum Abstracts was related to other databases. As you captured some users for a given database, you thought, "Okay, what else would they like?"

Did you do detailed analysis on the overlap, or did you guess?

Cuadra: We didn't have enough data to do real analysis. We relied on the customers. We'd say, "What else do you read;



Carlos Cuadra and Roger Summit tickle the ivories at an International Online conference in London, England. Carlos is mask-free this time!

what else do you use?" They would say, "We spin these tapes, and if we could get that online it would be wonderful."

Dialog-SDC Competition Heats Up

Summit: Carlos locked up Chemical Abstracts (CA Condensates) and American Petroleum Institute (API). Dialog could get CA, but Ev Brenner of API would never give us their database. I had all sorts of arguments with him, but he never would do it. I had a programmer on CA Condensates, but he couldn't figure out how to convert the database to put it online. He wasted 2 years. That put us way behind.

Cuadra: That's the one my son did in 2 weeks.

Summit: I remember thinking, "Boy, SDC really has an edge on us in chemistry." I remember how much we wanted to get CA Condensates. We also wanted MEDLINE. We worked and worked and worked and worked, and finally we got MEDLINE online. The other database that we had to have was Derwent World Patents Index. I met with Monty Hyams again and again over the years. Every time, Monty said, "Oh, we're working with Carlos and SDC and we're so happy with him. Why should we break that exclusive? Carlos tells me they need to keep their exclusive in order to stay in business, and I like Carlos."

Cuadra: From never having seen the NTIS database or a document, we got the tape, and it was on the air in a month. This is when Robert Landau was trying to shut down his online service business. The Derwent file took probably eight or nine months, partly because it was a very complex database. Our joke around SDC was, "We wish to hell Roger had gotten it." He probably put up 12 databases during the time that we were trapped with the World Patents Index.

[Laughter.]

Summit: We finally got it in the late 1980s. At his invitation, I visited Monty and stayed at his beach cottage. We played snooker most of the weekend, and he beat me every time. As a result of the weekend, though, we signed an agreement, and I convinced him to license the Derwent World Patents Index database to Dialog.

Cuadra: He's very competitive. The thing you probably didn't know about him is that he's a real kidder. When we were loading the database, we would have various kinds of catastrophes. It took 8 hours to load each segment, and our computer center guys would decide, "It's 4:15; let's go home." So they'd shut things off, and 7 hours and 45 minutes of load were dead. The next day I had to tell Monty Hyams that there would be a delay, and he would fire off these terribly insulting, "I can't conceive of what kind of incompetence" letters. Years later, I learned that he and Mike Brooks, his second-in-command, would sit around laughing as they composed these messages. While I was treating them with all seriousness, Monty was having fun with us.

As we were finishing the last load, a big lightning storm struck Santa Monica. It blew the computer off the air, and we couldn't complete the load. I had committed to give Monty the data that day, but I had to give him one of my usual malfunction reports, "You'd never guess what happened...." Fortunately, the *Los Angeles Times* came out that day with a large photograph showing a lightning bolt hitting a building. I mailed it to Monty as fast as I could, so that he would at last think we were credible.

Summit: We were really glad to get the database, but glad to be second. It was very important to us. Carlos used to say, "Whenever Dialog loads a database, we can see it in our bottom line."

Cuadra: Yes.

Did you encounter each other at meetings?

Summit: Always.

How did you interact? Did you share information? Were you friends from the beginning?

Cuadra: I'd say yes and no. We were competing for market share and for databases, but at the professional level. At panels and meetings, we voiced the very same message, promoting the use of online services.

Summit: That's right.

Cuadra: So did staff from NLM. So did a guy named Bob Landau, from Battelle; he was omnipresent. There were a lot of people who were promoting online services. Although we knew we were competing, we were in no sense enemies. We were trying to promote the same thing.

Kollin: Bullshit! They were enemies.

[Laughter.]

Cuadra: Not so, but we definitely competed. I always thought Roger, in his talks, exaggerated what Dialog was doing. I'm sure he thought the same of me. We were educating and also trying to get some marketing in sideways.

Marketing: Dueling Pianos

Summit: Even if we were competing, we still had fun together at various times.

Both Carlos and I attended the First East-West Online Conference in Moscow in October 1989. I was a little nervous, as you had to go through many lines and inspections. Here we were, coming into the country, standing in line, waiting to get passport clearance. Carlos had gone through earlier, and was outside a wire fence that separated us from the rest. We were just about to talk with the inspection agent, when Carlos walked by and said, "Oh, my God, that's Roger Summit! What's he doing here? I wouldn't have recognized him with a beard!"

Carlos is an excellent piano player. One time, when we were having a Dialog reception in some hotel, this man wandered up in full face mask and sat down and started to casually play the piano. I didn't know that Carlos was in town. His piano playing was so awful I was about to ask him to leave but I suspected, somehow, that it was Carlos, and I went along with the gag.

Cuadra: No, you didn't. We played a duet, and you told me later you didn't know it was me. My invitation came from two of Roger's staff members, Betty Davis and Betty Unruh. They didn't know what our feelings were toward each other, but they knew I played the piano. They were planning this event, and it wasn't a business meeting, so they thought it was OK. But they didn't tell Roger, just in case, so he couldn't say no. I decided to come in disguise and bought this mask, and I practiced playing the piano for 3 weeks to play rotten.

Summit: That's right. It was really rotten playing.

Cuadra: I had to practice with the mask because I could barely breathe in it. The holes were not large enough, so I had to learn how to breathe shallowly. I learned how to play without syncopation, old tunes like "Daisy, Daisy." I really played awful. Someone later told me that Greg Payne [developer of ABI/INFORM] said, "You know, I'd swear that's Carlos, but he doesn't play that badly."

Summit: We played in a duet at that International Online meeting.

Cuadra: Yes. I think we were very civil, in competition.

Summit: We were. The basis for that was we were trying to help the industry. I don't know if we ever had a conversation along those lines, but I'm sure we thought about it a lot. We didn't want to cut each other down, because then you would be cutting the industry. Our bigger job was to build the industry and then decide whether and how to get market share.

Other Tricks

Summit: We heard of another trick Carlos' customer services pulled. Sometimes a Dialog customer intending to lodge a complaint accidentally dialed the SDC number.

When this happened, SDC's customer service people would reply something like, "Yes, we are awful people. I wish you would switch to another service and stop bothering us with your calls."

Cuadra: I don't remember that!

Summit: It was something like that. Maybe I don't remember it exactly right.

Cuadra: Roger is not as loose-headed as I am. He was a more serious person, and he didn't smile a lot. There was a universal perception that he was a serious, serious person. We were at a conference once about information services, and it was a terribly dull day. We were standing around at cocktail hour. Some of us were talking about customer services, and I said, "Yes, sometimes we get a call, and we'll answer 'Dialog' and then ('an expletive') and then hang up." I watched Roger's face closely while I was telling this story, and for a split second he didn't know I was kidding. It was the most marvelous split second....

Charlie Bourne quotes you, Roger, as saying, "Carlos had a trick." I think it had to do with searching, but that wasn't my best trick. My best trick came when I discovered there were some people who were afraid of the terminal and the computer. They thought they could do some damage, or they didn't want to be embarrassed. But what can go wrong if you hit the wrong key? So I would start practically every demo to a new group by turning my back to the terminal and I'd just hit random keys. Then ORBIT would echo back what I'd typed and say, "No postings." Then I would say, "I've done that to show you that you can't make a mistake, you can't do any damage, you can't hurt the computer, you can't hurt the data," etc. It was very useful, kind of dramatic.

Summit: You had several effective tricks. I remember Carlos came up to me one time and said, "You know, you really picked a good name for your service. Every time I'm sitting in a meeting and somebody uses the word dialogue in conversation, I cringe because the word is used as a generic."

How did you convince customers to use one system over another?

Cuadra: We were very poor at competitive intelligence. We didn't subscribe to Dialog; we didn't try to get their user manuals or do the kinds of things that modern business people do. I'm probably not a good modern business person. To this day, when we see a library automation package that someone has written, one staff member will say, "Why don't we get a copy and see what it does?" We say, "No, we will never look at anyone else's code." Maybe this is a stupid moral judgment...that you do your own thing, and you don't worry terribly much about what the other guys are doing.

Our existing customers were the best source of additional income. They used online, they knew who we were, they had success. As for the rest of the great unwashed public, we

could go out and try to find customers, but that was hard work, to turn them from no customer into a customer.

Summit: That was the hard one.

Cuadra: The staff members of our companies were kindred spirits. They knew whom they worked for, and they were competing when they were side-by-side or across the aisle in a booth. On a personal basis, the competition didn't carry over. Judy Wanger of our staff reminded me that she and Betty Davis of Dialog were at a real dog of a conference in Alaska. Nothing was happening, so they shut down their exhibits and went off to look at glaciers together. They spent a wonderful day sightseeing.

Kollin: Roger and Carlos were close.

Summit: And Dick and I were close.

Cuadra: That's right.

Summit: So Dick played us both.

[Laughter.]

Cuadra: The Dialog staff members knew we liked buttons. They would come over to us and say, "May we have some buttons?" We had one that said "Go Into Orbit!" We asked "Why don't you put the button on?" And they said, "Roger would kill us!"

Tell us more about the conferences. You said before that you felt excluded at some of the early conferences.

Summit: That was way back in the 1960s, and excluded was probably the wrong word. I wasn't part of the inner circle. But then later, toward the end of the 1970s, and I'm sure the same was true of Carlos, we got invited to speak. Then, I didn't go to a conference unless I was speaking.

Cuadra: Roger Bilboul invented the International Online Meeting, which was probably the first world meeting focused on online information retrieval, and brought in the Europeans.

Summit: He was Dialog's European representative.

To characterize the competition early on, neither of us really knew if this online thing was going to amount to anything, but we felt it would, and we had our own programs.

The Database Race Continues

Summit: In terms of convincing database suppliers to go with us rather than somebody else — they didn't even know about the other folks. One of the greatest commercial coups that we got was INSPEC — it was called Science Abstracts at the time. I felt that if we could get Science Abstracts, that would really give us a steppingstone into the library community. Around 1973, I remember getting a 5-year exclusive on INSPEC. Once you start down a path, that leads to other things. We got the National Agricultural Library (NAL) database and that led us to want the Commonwealth Agricultural Bureaux (CAB) database, because they complemented each other. I wanted CAS; I wanted CA Condensates in the worst way, and Petroleum Abstracts.

Cuadra: There's a wonderful story associated with Roger getting the contract for NAL. Judy Wanger and I went to NAL to give the ORBIT demo to Tom Crawford, who was at NAL at the time. We accessed our computer in California to do a bunch of searches for NAL. I think we did all of them successfully except for one, which was on eggs. We came out one record short of what Dialog had found. We couldn't make sense out of it. We had the same database, we were doing everything the same. The one difference was that we had created something called the Basic Index. The Basic Index carries all the content words of articles so that you don't have to say, "I want eggs in the title field," or "eggs in the abstract field." You just say "eggs," and it searches those fields that carry content. Well, it turns out that in the NAL database there was a *Journal of Eggs*. Dialog didn't follow our practice, so when they searched for "eggs," they found that document we couldn't find because we were not searching the journal name field. It was a technical difference in the way we thought about the systems.

Summit: And the design.

Cuadra: In our case, we started with folks that had highly structured data, like the National Library of Medicine's MeSH vocabulary, where you don't say "heart," you say "cardiac." I think Roger dealt with some databases that were much more free in their language.

Naming Names

What were you calling this industry at this point?

Cuadra: Online bibliographic retrieval or online searching.

Summit: Online information retrieval. All of those. I didn't use bibliographic; I just said online retrieval.

How did you pick the names Dialog and ORBIT?

Summit: The name for the system, "Dialog," occurred to me in 1966. My wife Ginger and I were driving to Portland to visit her parents. Ginger was driving, we were talking to our daughter Jennifer in the back seat, and I was dictating a project plan for the system into a small, voice-activated tape recorder. We were trying to think of a name. The system was interactive between humans and the machine. The searcher would kind of say to the machine, "This is what I want," and the machine in effect replied, "This is what I have for you." So we decided to call it "Dialog." That was it!

I'd love to find that tape. Jennifer, whose crying could be heard on the tape, is now a professor at Stanford.

Cuadra: The programmers who wrote the very first version of ORBIT gave it its name. In SDC documents, it was referred to both as Online Retrieval of Bibliographic Text and Online Retrieval of Bibliographic Information Time-shared. When it was time for us to name the PL-1 successor to ORBIT, I solicited names from my staff and we voted to keep the name. We couldn't think of anything better.

BRS Enters the Industry

You've talked about the cordial competition between Dialog and Orbit. What was the relationship with BRS (Bibliographic Retrieval Services), which started commercial service in 1977?

[Silence.]

Was there any relationship?

Summit: Charlatans.

Cuadra: Yes.

That's how you both feel?

Cuadra: Jan Egeland is a very smart person.

Summit: Very strong.

Cuadra: Very smart, very capable. The BRS service started with the State University of New York and federal funding and then, when that funding disappeared, they had to go commercial. They decided, because of the way they got computer time, that they would offer unlimited use for a fixed fee. They took advantage of that to pooh-pooh the people that charged by the inch, the taxi meter folks.

Summit: They advertised a fixed price, unlimited use charge, but in small print, they indicated there was also a charge for royalties, and this charge was an hourly charge.

Cuadra: Their advertising said something like, "Look, Dialog and SDC charge \$50 an hour. We charge only \$25 an hour, plus royalties."

Summit: Yes, something like that. That's right.

Cuadra: We regarded that as an unethical way to sell their service. BRS also had a user group. I'm sure they listened to them, and it was helpful, but they used it to say, "The difference between us and them is that we care about our users..."

Summit: ...they engendered this non-commercial feeling. "We're a cooperative,"...that's what it was...kind of a non-profit cooperative atmosphere.

Cuadra: "We're for you."

Summit: And they said, "We're only going to deal in bio-medical literature, we're not going to spread all over the place." When I saw that, I said, "Bullshit," because the way the business goes, you can't do that. Sure enough, bingo, bingo, bingo, they started getting our databases. The same thing happened with Chemical Abstracts Service and CA Online. The Chem Abs people also said, "We're just going to do chemistry," and then all of a sudden, there was STN, which grew into a diverse database offering.

It sounds like the two of you viewed BRS as THE competitor, but you didn't view each other as competitors.

Cuadra: We saw ourselves as fierce competitors.

Summit: Yes, we did as well, but BRS had a different agenda. They were doing this "We're a non-profit cooperative" thing, and, "We're giving everything back to the customers." That wasn't true. As Carlos just indicated, they

were as competitive in every way as we were, but they were representing themselves differently. I think that's what bothered me.

Another thing with BRS is that they didn't use their own software. SDC developed software. We at Lockheed developed software. BRS went out and bought the IBM/STAIRS software.

Cuadra: But later, BRS rewrote the software completely, in fact, converting it into a different language. I said, "Aren't you going to get caught? You're stealing stuff." And I think it was Ron Quake who said to me, "Big companies don't sue little companies."

Summit: There is another anecdote regarding BRS. I had a visit from Heinz Ochsner and Ramon Renaldo in about 1978. They asked to license the Dialog software because they wanted to start an information retrieval business in Europe. I said, "No." We had a long conversation, but I said, "No, no, no." Dialog dominated Europe at that time, and there was no way that we wanted to have another competitor. So they went to BRS and negotiated to get the BRS software, either in its STAIRS form, or if it had been rewritten, in the BRS form, and set up Data-Star. Ron Quake played a rather neat trick on them. He would not license the source code for the software; he only licensed them the object code. As a result, Data-Star never could upgrade or modify its software like the rest of us did. Every time the other guy did something good, we'd put it in. They were really stymied for a long time with the BRS STAIRS software.

Government vs. Commercial

Cuadra: There's one thing to add to that. In 1972 or so, SDC sued the National Library of Medicine on two counts. One was to get the MEDLINE database under the Freedom of Information Act. The case was thrown out of court on the basis that the Freedom of Information Act was really about documents — government data on tape didn't count. It was a stupid decision, but at the time, who thought?

The other lawsuit was about NLM taking ORBIT and claiming they owned it. ORBIT was written by SDC. NLM paid us to add three commands, which we did, and then we gave them the rights to use the software for MEDLINE. But NLM said, "Now we have this, we can give it to anyone we like, we can sell it." We said, "No, you can use it for yourselves, but you can't go into business and kill us." So there was a big lawsuit lasting for several years; it went to the Supreme Court. There was a four-to-four tie. Since the Court of Appeals had ruled for NLM, that's how the suit ended.

The important thing here, apropos of BRS's cleverness, was that the lawsuit in effect froze MEDLINE search technology for the next 25 years. Marty Cummings of NLM said, "Boy, I can hardly wait until I get Carlos Cuadra on the witness stand." We were *persona non grata* at NLM. It was the president of SDC that decided, not me, but in effect, it froze NLM, and they didn't participate in the improvement of

online retrieval technology for 25 years — except for the addition of the Grateful Med front end in the late 1980s, and now PubMed that's available on the Web. To me, that lawsuit, with its aftermath, was a major historical event.

Summit: I also went after MEDLINE like you can't imagine. I had Excerpta Medica, then I wanted to get MEDLINE. I talked with Marty Cummings and other guys, and they had every reason in the world not to give us the database. I think they were defending their turf, namely their own system. They probably had a qualitative argument as well, in terms of all the training they did. They required 3 weeks of training to become a MEDLARS searcher.

Cuadra: They wanted to be in business, not government.

Summit: Yes, they wanted to be in business. The same thing was true with the NASA database. We could not get that to offer — even the unclassified, unrestricted distribution part — because Van Wente wanted to be in business. These government agencies, once they established their fiefdoms, just didn't want to have competition from commerce in spite of the President's A-76 Memo that says if industry can do it, then government shouldn't do it; if government has to do it, then they should not disadvantage industry.

Cuadra: The Information Industry Association took the A-76 Memo to heart and put a lot of pressure on the government, but those agencies wanted to be in business, and they wormed their way out.

Summit: They did. All the way through.

Pioneers and Innovators

What other players, in addition to database producers and online systems people, were important in creating this industry?

Summit: Telecommunications — Tymshare. Packet switching — Tymnet.

As an aside, we signed up for Tymnet in order to get packet switch telecommunications around the U.S. Turns out that Tymnet was an international service bureau, and they'd set their network up to include Europe in their time-sharing. As a result, if you were in Europe and you knew the right password, you could hook directly into Dialog by way of Tymnet. Such use was not tariffed then, so searching didn't cost anything. For a time in the early 1970s, it was cheaper to use Dialog in Europe than it was in the U.S. This gave us an edge in building up a core of overseas customers. We stayed with that lead for years and years.

Cuadra: I made a list of the important people and factors, and communications companies that provided low-cost, reliable communication were important.

My number one on the list is those agencies — such as NLM, NASA, and the Office of Education — that funded some of the early research, or just tried it out. My third group includes the opinion leaders who caught on. At the top of the list is a Finn named Sauli Laitinen. Sauli caught onto the promise of online and gave talks and demonstrations. He was using online even though it cost \$70 an hour

in communications time to get from Finland to Los Angeles. Sauli was a true believer and proselytized. The test of his effectiveness was that at one time we had 30 to 40 users (companies and organizations) in Finland and zero in Germany. Sauli and some of the other folks that didn't have colossal information resources caught on to the fact that by using online tools, they could be as good as the Library of Congress, the University of California, and all those who had tremendous resources. I also remember some people at Mankato State College in Minnesota; they put in an online service at least 3 years before the University of California (my alma mater) put in their first terminal.

The need was there, right?

Cuadra: They caught on.

Summit: Recognition was the key. They all had the need.

I would add Jeff Pemberton and his wife Jenny — they developed the first *ONLINE* magazine and conferences in the U.S. We must include Mel Day at NASA, who, with Mortimer Taube (Uniterm Index concept), was responsible for developing one of the first dual-purpose, computer-readable databases: NASA STAR. Dual-purpose in that it was used directly for generating the NASA STAR print catalog and as the source for early information retrieval. He was also in overall charge of the NASA/RECON development.

Cuadra: Regarding people who aided the industry, I have a ton of names. The people that promoted NASA/RECON. Three people at NLM: Ruth Davis, Davis McCarn, and Joe Leiter. Dick Giering of Mead Data Central. Jerry Rubin of Lexis.

Summit: Yes, Dick Giering is a special person because he really designed and programmed the Mead system; he invented the world's first full-text access, interactive database system. We all duplicated his feature of proximity searching, a feature I may not have included except for the persuasiveness of Mark Radwin, one of our genius-level staff.

Dick is brilliant. When Jerry Rubin came along — Jerry is an attorney — he refocused the company on the legal business and later added Nexis for news.

Would you consider Jerry Rubin the creator of Lexis?

Summit: I'm not sure, but Dick deserves some of the credit. Lexis was launched in 1973, and, I believe, was merely a database added with heavy promotion under the auspices of the Ohio Bar Association (OBAR) to the Data Central system that Dick conceived and developed.

Cuadra: Let me mention other important names. Irwin Pizer of SUNY Biomedical Communication Network; Jan Egeland, BRS. Lee Burchinal, U.S. Office of Education. Eugene Garfield, ISI. Jeff Pemberton, Online. Fred Kilgour, OCLC, the first library utility, where the concept of using the same computer, not for searching necessarily, but...

Summit: ...Shared cataloging system. Kilgour came out to visit us in the early days and we gave him a Dialog demonstration. He said, "You've done everything I was planning to do," in terms of extending the catalog.

Bjørner: I heard Kilgour speak many years later at an ASIS meeting in Boston; essentially, he spoke about putting tables of contents of books on OCLC at that time; that's all happened now.

Cuadra: I don't know a specific name, but the people at Chemical Abstracts Service, who were involved in automating their processes. They got some money from the National Science Foundation and created a factory, a very, very efficient factory.

Summit: It was the head of their computer operations business, Ron Wiggington, whom I credit with that.

Cuadra: I'd list Bob Katter of SDC, who was the head of ORBIT programming; he worked for me but he did the dirty work. Also, Judy Wanger, whom I once referred to in a meeting, and she's never forgiven me, as the world's oldest living online trainer. A most infelicitous way to say it, but she was out there before anyone else with this clunk, clunk, clunk Teletype, showing people online services.

Summit: Internally, I had some superstars as well. The first hero was Ken Lew. He adeptly programmed in assembly code to fit Dialog into a 40K RAM computer (IBM 360/40). Without his skills, there may never have been a Dialog.

Kollin: Ed Parker and Fran Spigai.

Summit: That's right. Ed was in charge of SPIRES development at Stanford. Fran was one of our best early marketing people, who with Bob Donati on the East Coast, brought in and supported the customers.

Cuadra: Roger Bilboul of Learned Information, for starting the International Online conferences. Helen Brownson of the National Science Foundation. She funded a fair amount of research, and she provided the money that enabled us to start the *Annual Review of Information Science and Technology* [ARIST].

I don't know their names, but the inventors of TCP/IP, which derailed IBM SNA and led to the Internet. There would be no Internet without TCP/IP. To me, Paul Zurkowski of the Information Industry Association was important. I also list the people who created BASIS and Battelle's online service, but I don't know who they are. And the inventors of packet switching networks.

Summit: A fellow named Larry Roberts is in there somewhere associated with packet-switching.

Cuadra: Yes, I would think so. And then, the people in the library profession — tons of them — who literally reinvented themselves on the job, and moved from being the custodians of dusty stuff to the people who did research and helped market the business.

Summit: Their names are legion.

Were there any that stand out?

Cuadra: Bill Stanley of Standard Oil in Illinois. Margaret Graham, Barbara Lawrence, and Ben Weil, all at Exxon. Don Hawkins at AT&T. The Don Hawkinses of the world were like our sales agents. They popularized it within the orga-

nization and took risks. And gave papers, saying, "This really works."

Summit: I would add Martha Williams. She was a strong supporter who wrote and spoke prolifically. Margie Hlava was very active in promoting online searching and supporting online through leadership in the library and information professional associations.

Kollin: Henriette Avram.

Cuadra: I'm not sure whether MARC is a wonderful thing or a disaster. It's a nice communications tool, but it's done terrible damage in terms of making people think how they should search. It does its job as a communications format, but people are trying to apply it to things for which it wasn't designed, such as museum collections and audiovisual materials. What's happened is that libraries stuff things in the wrong field because there isn't a field, so when you look at a tape, you don't know what you've got.

Summit: We must add Sam Wolpert, who developed the innovative Predicasts database. One time he said that every event in the world can be classified according to geography, product type, transaction type, and time. He set up his indexing schema along those lines. This was our first business database. It focused on chemistry and electronics and was subscribed to in hard copy form by most of SDC's chemical customers.

We beat SDC to full-text title and abstract indexing and this was one of the reasons. Predicasts gave us an exclusive for a time.

Cuadra: Another key person was Monty Hyams of Derwent. He was a pain, but he was one of the first people to say, "I'm going to pay you to put my database online. You can make some money, but I'm going to run it." The thing that was so painful was, he wanted the displays and printouts to look exactly the same as his printed products. He never caught on to the fact that having uniform search terms across databases was a benefit and could create traffic and money.

Bjørner: This attitude is still with us. Some people who are responsible for and wed to one particular set of data don't understand that nobody's going to pay big bucks to look at that particular piece of data in isolation; they want to see it in conjunction with a bunch of other pieces.

Cuadra: That's right. I think of what we and others did. One of the most important things we did was to create as uniform a language as one could get, so people understood that AU means author and TI means title, etc.

Is there anyone on your list from the library and information science schools?

Cuadra: The library schools didn't have online, until you, Roger, started making it easy.

Summit: Yes, we made it free.

Cuadra: I didn't see them as a group pushing online.

Summit: We did.

Kollin: Ted Hines was important. He was my professor at Columbia. He later went to North Carolina.

Do you consider each other pioneers?

Summit: Yes.

Cuadra: Not for me. I was aware of what Roger was doing, and I knew that not many other people were doing it. But just like the hero badge, you don't put it on until some point in time when the world says that you're a hero or a pioneer.

Did you have heroes?

Cuadra: Hans Peter Luhn. Every time I hear someone talking about push technology, I think of Hans Peter.

Summit: Calvin Moores.

Cuadra: Calvin Moores. Dake Gull. There are a whole pile of folks that used to be the core of the ADI, the American Documentation Institute.

Online Then and Now

Are there any current pioneers that you particularly admire or respect?.

Cuadra: I can't think of any. We're not very interested in the Internet. Our software is for intranets, so I have some heroes among customers who have caught on and who have learned how to serve their organization and thereby help the library or the records center continue to exist. They're numerous.

Summit: There are services I admire on the Internet. Copernic, which is a metasearch system, not an engine per se. I admire the WebTop product. It's concise and flexible. I think eBay is a fantastic innovation. A lot of the Internet commerce things just blow my mind.

Cuadra: MapQuest, of course.

Summit: The thing that overwhelms me is that when Carlos and I were reviewing the history, there was a handful of people thinking about developing features and systems. Now, there are millions. All those little brains popping. Somebody gets a little nuance of something and it becomes a business, because there's so much money floating around. The innovation and the growth of these Web applications are just overwhelming.

Are you glad that you developed online back then?

Summit: Oh, absolutely.

Cuadra: It was fun.

You don't wish that you were developing it now?

Summit: No. I think I would have trouble sleeping now — and I didn't have trouble sleeping then — if I were dependent upon singular innovation. Some guy down the street is staking his whole family's future on something that integrates e-mail and a Web browser, and there are a lot of those around. I don't know how he's going to differentiate his service from everything else going on.

We're glad you were able to sleep while you were developing the online systems.

Summit: Well, not always.

[Laughter.]

There was a show I saw on CNBC, called something like *The Summit of the Internet*. They had kind of the top guys — the founders of Yahoo!, the founders of eBay, the founders of so-and-so. They all sat around in an interview. The questions were good. One was, "Now that you're all so rich, does that mean that you just go off to Hawaii and sleep late?" To the person, each said, "No. We started out with a mission and we still have that mission to accomplish." I think that epitomizes what Carlos and I think as well.

Cuadra: Did they come across with a mission that was as together and pure as our generation? Now, it's move more ads and squish the portal next to you, and pretend we're different when....

Summit: They sounded very sincere and dedicated to what their mission was. Now, I don't think their missions are nearly as important as our mission was.

Cuadra: OK, fair enough.

From Early Online to the Internet

Cuadra: The Source and CompuServe were kind of a bridge between professional online services and the public. They introduced millions of people to e-mail messaging, made them keyboard literate, and in effect paved the way for millions of people to adapt to the Web.

Were you on CompuServe through EasyNet?

Cuadra: No, we weren't.

Summit: We gatewayed from CompuServe through Dick Kollin's EasyNet service.

What about Knowledge Index?

Summit: Knowledge Index was different.

That came off.

Summit: Yes, that was none of my doing.

[Laughter.]

We want to talk more about the Internet. Some of the people with whom we've discussed this series have characterized you not as pioneers but as dinosaurs. You became "dinosaurs" in the early 1990s, they say, because you were holding on to high-priced information that you thought was special, and it stood in the way of the development of the Internet. Didn't you recognize the importance of the Internet?

Summit: Two comments on that. One is that 50 percent or more of our charges were for royalties, which we paid our database suppliers.

We made a big mistake in pricing the service by the hour. We did it because ERIC was \$25 an hour, and \$25 an hour sounds good. But since we were charging connecttime, we

should have started out pricing it by the minute, like the phone sex services do today. You pay maybe a dollar and a half per minute. Look at some of these ads. They are far pricier than we were.

Ardito: One article I read about the early online years and pricing stated that you, Carlos, and some of the others deliberately charged by the hour because the 300 baud rate was so slow.

Summit: That's possibly true. Another thing is the distinction between the database, the information, and the customer service that sits behind the information. I believe the people who are making these comments think we're selling information. We're not selling information. We're selling a process of retrieving and identifying information and training people to be effective in the process. That's gotten lost in this whole thing, particularly since people started taking Internet search engines for granted. But the search engines don't have nearly the sophistication that even our early systems did, and no service to speak of.

When they started out they said, "We don't need all this complex, boring stuff." You'd just put in a paragraph of words, and it would give you exactly what you wanted back — all 70,000 hits. They seem to be competing to see which one can get the most hits. Consequently the default operator between words is "or," not "and," though some are changing.

But if you look at each one of the search engine services, they've added sophistication. Maybe they call it advance searching or something else, but they're bringing in Boolean, they're bringing in field specification, and I predict they'll bring in every important feature that we introduced years and years ago.

Yahoo! started out with a classification system. They didn't have a search engine at all. They had four categories: earth, air, fire, and water. They said nobody needs more categories than that. Now they have 70 or 80 librarians doing the classification for them.

Björner: I remember when Northern Light started; they had classified ads in the *Boston Globe* to hire librarians.

Summit: They were slick. They pointed themselves at the business market, the librarian market. They took in end users or consumers, but I think they were in our business domain, whereas Alta Vista, Yahoo!, Google, and Copernic, are not really in our business...or what was our business.

Cuadra: When you said dinosaur, it made me glad that I got out of the business in 1978, so only you, Roger, got to be a dinosaur.

Summit: You were an embryo!

Cuadra: I moved on. I evolved!

What I want to share with Roger is about one time when he and I went to an IIA meeting and had exhibit booths across from each other. He'd come over to my side for a while, and I'd show him something, and I'd go over and he'd

show me something. And then I said, "They have a new retrieval system up the aisle." I don't know if it was Xerox or some other company that was touting this new system. "Let's go up and look at it." We walked up and a young fellow showed us the screen, and I said, "Can you find something on water and elephants?" (or some two-term search). He paused and said, "I can't do that; the system doesn't do that. That would be a Boolean search." And he started explaining Boolean logic to us. And there we stood with our name badges in view: Carlos Cuadra, SDC Search Service; Roger Summit, Dialog. We walked back and I told Roger, "We are over the hill. We are absolutely over the hill."

However, you remember we invented gateways?

Summit: Huh?

Cuadra: That was very important; to me, it was the first Internet. Say, SDC has something online, and there is another database that's available on some other service, but the producer doesn't want to give us the database to load on our system. So you say to the customer, "Okay, you search our database, and if you're interested in the other content, we'll link you." It's done transparently. In some cases, they don't even know that they're using someone else's online service. That was a bone of contention. I once made a chart...

Summit: I see what you mean. I remember that.

Cuadra: ...of 300 connections where you get from database to database to database all over Tymnet or Telenet. That is the exact model of the URL system. I don't think I've ever seen any recognition of gateways as performing that role.

Summit: TRADELINE, for example, right now on Dialog. You go in there, and there are different interfaces.

Kollin: Remember EasyNet?

Summit: Yes. It was an end-user, cross-search service, natural language translator that Dick invented. It would allow a user to ask a question, and then EasyNet would translate it crudely into Boolean to be read by Dialog. It was very basic.

I came to this comment by way of a long conversation, but after we had talked awhile I said, "Dick, this is really crappy." And he said, "I know it's crappy, but it's good enough." He said, "These people that are using it are used to getting nothing, and now they get something, and that's good enough. They don't need to get everything." That was a very profound observation. If you extend that statement to what the Internet is today, it's exactly right on. "It's good enough." ♦

Searcher bonus: For "Who's Who," "What's What," and "Further Readings" sidebars, go to www.infotoday.com/searcher/jul03/ardito_bjorner.shtml and click on the three corresponding links.

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