



RDBMS Plenary Session: The Later Years

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RDBMS Plenary Session: The Later Years

Conducted by Software Industry SIG – Oral History Project

Abstract: The relational database pioneers in attendance discussed the evolution of the industry from the late 1980s through the end of the 1990s. They covered a wide range of subjects including other companies in the relational database business, the growth of each of the companies, the problems that they ran into and how the use of relational databases migrated from decision support to transaction processing. They talked about the reasons for the dramatic growth that took place and how each of the companies handled this growth and the subsequent competition. They described the mergers and acquisitions that took place and who is remaining standing in the marketplace. They discussed the impact of Microsoft entering the market and the impact of PCs, the Internet and the World Wide Web. They speculated on what would be happening in the future in terms of technologies and applications.

Participants:

<u>Name</u>	<u>Affiliation</u>
Burt Grad	Moderator
Michael Blasgen	IBM
Marilyn Bohl	IBM, Ingres
Paul Butterworth	Ingres
Don Chamberlin	IBM
Sharon Codd	IBM
Chris Date	IBM
Don Haderle	IBM
Roy Harrington	Informix
Jerry Held	Ingres, Tandem, Oracle
Mark Hoffman	Sybase
Mike Humphries	Oracle
Ken Jacobs	Oracle
Bruce Lindsay	IBM
Robert MacDonald	Informix
Stu Schuster	Sybase
Roger Sippl	Informix
Jim Strickland	IBM
Moshe Zloof	IBM
Peter Capek	Historian, IBM Research

Thomas Haigh
Doug Jerger
Luanne Johnson
Michael Mahoney
Jan Phillips

Historian, Univ. of Wisconsin
SI SIG, ADAPSO/ITAA
SI SIG, Argonaut Systems
Historian, Princeton Univ.
SI SIG, DEC

Other Relational Database Companies

Burt Grad: We ended up our first plenary session discussing the mid-1980s. I know we talked about a lot of the things since then in the workshops, but let's just to make sure we have it all together. In the mid-1980s, besides the five companies we've talked here, IBM, Oracle, Informix, Ingres, and Sybase, there were a number of other companies starting to move into the relational database marketplace. Can we name some of those just so we have it for the record?

Sharon Codd: Teradata. Tandem was in the marketplace.

Ken Jacobs: Britton-Lee.

Codd: Britton-Lee, Unify.

Stu Schuster: Interbase.

Grad: Any other combined hardware, software companies as against software only?

Jacobs: Well RDB. Digital had RDB.

Roy Harrington: DEC RDB.

Jacobs: Burroughs had the BS-2000. Almost all of the hardware vendors had their own databases for a long while.

Harrington: Ken, didn't Fujitsu have a system?

Jacobs: Yes. It was called AIM.

Codd: HP did also.

Grad: So, in the mid-1980s we not only have the four companies that we have represented here as pure software companies (plus IBM), we have lots of other hardware companies providing relational database software. IBM is not a true software company I have to admit and certainly at that point of time as everyone has pointed out, IBM didn't seem to give a damn about the relational software. They only cared about the hardware. I was quoting Mr. Haderle who keeps saying that it was a hardware-oriented company. Did you keep saying that?

Don Haderle: It derived its revenue from hardware.

Grad: Yes. Now, given all that, what happens now? And during the 1980s and at the end of the 1980s what's happened? Are all these other players still in the ballgame? Are there less of them? Are there some other new ones coming in at that point in time?

Jacobs: Well I think some of them didn't implement SQL and were forced to and those that didn't probably were under some pressure from customers and ISVs who wanted to conform to a standard. So standards had an impact on those other players.

Schuster: And the feature wars and the marketing wars meant that you had to be very fast in your development and you had to be very aggressive on marketing and sales to make it and raise money, either publicly or privately, to grow. So I wouldn't be surprised if all of these companies still have installed bases somewhere out there. It's just amazing how long they stick around.

Jacobs: Well, RDB is a good example. Oracle acquired RDB from Digital in 1995 and we still have a lot of customers running on RDB. It runs only under VMS. It's been ported to the newer hardware chip architectures but there's a good example. The other thing, even then though it was true that at least I remember on a couple of occasions where Oracle did benchmarks against the native database provided by the hardware vendor, we could outperform them so it wasn't only features and standardization. It was just raw performance.

Grad: How big was the relational industry at the end of the 1980s compared to the hierarchical and network databases, anybody have any sense of that? Let me have you meet Len Shustek, who is the chairman of the Computer History Museum. Len has been a driving force at the Museum. He actually drove the trucks that brought all the stuff that's here from Boston.

Jacobs: That is a driving force.

Growth of the Relational Industry

Grad: Thank you for coming in. At the end of the 1980s, how big was relational software business compared to the traditional database business?

Roger Sippl: I think it's relational versus the mainframe software business because IBM was probably the bulk of that, so you'd have to ask them.

Grad: They'll never tell me.

Sippl: You have to take IBM's numbers and Cullinet's numbers and Cincom and add those up, but I suspect the relational database business even apart from the mainframe was bigger than all the other database companies.

Codd: Marilyn, can you say when DB2 caught up to IMS.

Marilyn Bohl: By 1989.

Grad: In 1989 the revenue of DB2 was as great as IMS?

Sippl: Well then relational clearly passed non-relational.

Haderle: That's correct.

Grad: I can't believe that number. In four years, five years you had sold enough DB2s to more than compensate for the entire installed base of IMS over a 15 or 20-year-period?

Haderle: Well, no, no, no, not the cumulative. I'm talking on an annual basis.

Grad: But the money is maintenance money. That's where the bulk of the money comes from, not from the new sales, right?

Haderle: Again, the pricing of the product of software on mainframe wasn't to make a lot of revenue off of the software. It was to sell the hardware if you recall, so it is not the software revenue that it returned, it was for the revenue returned on the storage and on the processors.

Grad: So you're saying IBM was low-balling the price?

Haderle: I didn't say that.

Thomas Haigh: Was DB2 more expensive than IMS?

Haderle: No, in fact, there were lots of strict rules inside of how you would price it depending upon the number of seats that you would actually be in so that you would not do any kind of gouging, but still the overall business was profitable.

Mark Hoffman: You're saying these are two rental products and the yearly rental of DB2 surpassed the yearly rental of IMS.

Haderle: That's correct.

Hoffman: That blows my mind. Are you talking about total or new sales?

Haderle: Total, yearly rental. There are new customers each year and I could believe that new customers for DB2 exceeded the new customers for IMS in 1989. That probably happened earlier than 1989. It took off like crazy in 1988 with version 2.1 on transactions and then in 1989 book revenue was about the same, was roughly the same where we were on IMS.

Codd: And so there has been a very large CICS VSAM market.

Haderle: Huge.

Codd: Huge and a lot of those people went into CICS DB2.

Haderle: Yes, but there are still more CICS VSAM customers than there are CICS DB2 customers. I mean they're still huge.

Grad: Let's leave out IBM for the moment. How big were the relational customers? This was all public information, I guess, Ken, what's the 1989, 1990 number?

Jacobs: You know I don't know. If I gave you a number, I'd be wrong.

Sippl: We were \$145 million in 1989 in net revenue.

Hoffman: So, Ken, the number I came up with for 1989 was somewhere between \$650 million and \$700 million.

Sippl: It was a billion dollar industry.

Grad: So, it was a billion dollars in the four software companies and whatever else was being picked up by the other companies. That gives me a ballpark. That's a significant thing. You grew an industry. The first ten years there was technology work going on but you don't seem to start much business growth until about 1980 when it starts to become significant in numbers. If we add on the IBM numbers to whatever you have in the billion dollar range you probably have close to a billion and a half or even a \$2 billion industry.

Codd: In 1991, Information Week ran an article. Now Don and Marilyn can verify that but at that point they said IBM was making \$2.1 billion on DB2. I don't know whether they included the hardware drag but that was the number that was published.

Grad: Okay. Look I don't want to beat it to death but the point I'm making here is you had grown to a billion dollar industry essentially in a ten year period.

Schuster: And the interesting thing is, is it was still 50 to 100 percent growth rates for these companies.

Grad: Right. I don't think there was anything that I remember in the software world with that kind of trajectory. That was what I was trying to get to.

Schuster: The only other thing I can think of is spreadsheets which were enormous. That was enormous.

Grad: Okay, I have numbers in those and Martin Campbell-Kelly does too. It's in his article that's going to be in the issue of the Annals coming up [Volume 29:3, July-September 2007]. It's a different thing. You were selling to a corporate market basically. They were selling to hundreds of thousands and then millions of people. It's a whole different ballgame with those end use products in my view.

Jacobs: Microsoft and Oracle went public on consecutive days in 1986 and at that time our market caps were not too different. I mean we were a close number two and there was a period of time during the dot com bubble where we actually surpassed them for a short while and Larry [Ellison] was actually richer than Bill [Gates] for a brief time.

Sippl: Six months.

Jacobs: But the fact is that their growth, when you talk about growth I think they've

surpassed everything else including the database business.

Grad: As a company you're thinking about the Microsoft Windows product?

Jacobs: The Windows franchise if you include the operating system and Office.

Grad: But to my mind there is a very different market and that's what I was trying to get at. Your companies represent more the old market that I'm used to. You're selling to corporations to do the business applications.

Jacobs: Right.

Grad: This is the infrastructure for the world. The world runs on your infrastructure. These others are different, not saying they're less important work but for example games are big business, and there is a lot of money there, but it's a different kind of business, a different kind of sales strategy, different kind of technical innovations required. It's a whole different-- it's a different framework. I think relational database is a very special story. You're almost all here. This happened in Silicon Valley which is better known for its hardware companies. But it didn't happen in a single location anywhere else for software companies that we've known of. That's one of the things that's fascinating about getting this group of people and this group of companies together; it's very special.

Schuster: I think the market exceeded our expectations. When I joined Sybase I believed we could get to \$100 million but the idea that it would get to \$1 billion run rate or that Oracle would be getting to multiple billion dollar run rates was just totally was out of my projection. No one thought that there would be this much demand for these types of applications at these levels.

Grad: It's an amazing story.

What Fueled the Growth of Relational?

Jacobs: What do people do with all this software? Who are these people who keep buying this stuff?

Grad: My grandfather was in the laundry business and when I went to work for GE he says, "What do you do there?" And I said, "I do this kind of thing. I'm writing programs." He says, "Are they paying you?" He says, "What do they need them for? What do they need so many for?" Let's keep going.

Sippl: My initial forecast performance topped the four-year forecast of my original business plan in 1980 to 1984. I forecasted that in 1984 it would be \$1,350,000 of revenue.

Grad: And they said you exaggerated.

Sippl: And even when I re-forecasted it like in 1984 or 1985 it had the revenue forecast to go from like \$5 million to \$10 million but then from \$10 million to \$18 million to \$24 million to \$35 million, a 100 percent growth rate sustainable through multiple consecutive years.

Schuster: Considering the number of competitors.

Grad: And you grew through internal stuff. You didn't grow through acquisition.

Sippl: Right. It was all internal for us.

Grad: That's another big thing. CA is growing during this same time period. Sterling Software is growing. But they're growing through acquisition.

Sippl: And it was all profitable growth. You can grow really fast sometimes, but you have to lose money to do it. You just hire a whole bunch of salespeople. You lose money for three quarters, maybe even a year or two, and then finally they become productive and, boom, your revenue goes skyrocketing and then you get back to profitable.

MacDonald An interesting thing that I know helped us maintain that growth was the demise of some of the older database companies because we got experienced personnel in sales in the field from then, Cullinet's demise because of their refusal to move to an open systems relational product which their sales force wanted but they couldn't decide to do, or couldn't build one. When they went under we got a bunch of experienced field personnel, both at the executive level and the key contributor level which helped us maintain that vertical growth rate.

Grad: That's an interesting point to pursue. When did Computer Associates buy Cullinet?

Chris Date: In 1988.

Grad: Okay. Had CA acquired any of the other database management firms at that point in time? ADR had been acquired somewhere not too far from there, so you're having them go to a company that doesn't aggressively sell them to new people.

MacDonald Yes, they were milking. They were milking the installed base.

Sippl: There was the demise of the mainframe business at the same time. The Univac and all these early guys had big database businesses in the earlier years and IBM was the only mainframe company that made the transition. All the rest of them had wonderful people that came out of Burroughs and other places, both technical and field, so a lot of the growth was fueled by the availability of these people.

Grad: But it was fueled both ways. Your technology was getting better and better. The minicomputer hardware was getting cheaper compared to the big mainframe stuff and the old database vendors weren't doing very well and weren't paying much attention. This is an example. We've had this in some of the other areas. Of the successful early people who had a big installed base, not one of them moved into the relational area did they? All the people who had good database management systems, like Software AG, didn't really move in and become a competitor. Cullinet didn't move in and become a competitor.

Schuster: You basically have to build a new product or acquire a similar one.

What Happened to the Non-Relational DBMS Companies?

Grad: So why not? Why are the companies who were there not smart enough?

Jacobs: Some of it is Christensen's "Innovator's Dilemma" that you are servicing your customer base. You want to focus on the high margin customers and you don't want to undercut yourself with a different product that's going to hurt the old business.

Grad: Doesn't anybody read history?

Sippl: Innovation is hard to do in big companies.

Schuster: Well IBM did it.

Jacobs: IBM did it.

Grad: But notice how long it took.

Schuster: And DEC did too but by the time they did there was a whole independent industry and they were never technically competitive.

Bruce Lindsay: And that industry was largely based on their minicomputers.

Schuster: Right.

Grad: Well, but that was an opening for DEC.

Jacobs: Yes, but they didn't choose SQL. I mean had they chosen SQL the world might have been different. When they came out with RDB, I think it was 1985 they left a big opening for Oracle.

Market Focus and Expansion

Michael Mahoney: I was wondering to what extent the kind of product you were building was creating part of your market and to what extent was your market based on creating demand for this, that is people discovering they could now have a database in their business where they hadn't thought about it previously and was your marketing aimed at helping them come to that decision?

Sippl: You know I'd like to take a whole lot of credit for that sort of, stuff but I think Moore's Law played a much bigger factor than anything volitionally we did. The thing we volitionally did I think was we started companies at the birth of the microcomputer, microprocessor age and I always relied on Moore's law. I always built software that wouldn't quite run on the computers that we had when we started the project and a year or two later by the time we finished the project they ran on those computers and two years later they ran fast and there was a lot of space left over. So we couldn't go to SQL right away because it just wasn't going to fit on the computers we were targeting, but by 1983, 1984, it would fit so we did make that move then.

Mahoney: Yes, but I was thinking about the extent to which you were out there helping small businesses discover that they actually could use a database.

Schuster: It wasn't small businesses. It was big businesses, but somebody brought this up I think it was Bruce [Lindsay]. The application backlog in the mainframe industry was so huge and departments never got serviced. It was the finance department fundamentally who got the attention and for the rest of these departments, the minicomputer was the answer. We forget that VAX was so key to all of us, before UNIX really was respectable and took off. There were so many people who said, "Look, I can now afford to buy my own departmental machine for manufacturing or in sales or in customer service or whatever and buy a database program and buy this new language." And I think it was SQL. What SQL did to building applications is equivalent to what spreadsheets did to manipulation of financial data. It just dramatically,

dramatically cut the time to build an application. When you add the 4GL tools that were built with it and now you're dealing with things that used to take years to build could be done in months. People gave up on the mainframe, and went to the minis and then the workstation micros and servers. That really opened up the whole opportunity. I think we underestimated the market, the inherent market that was out there for building applications.

Sippl: So it was a latent demand that you just brought out.

Schuster: Yes.

Codd: I agree with that too.

Jerry Held: Roger's point is right. The accessibility to computing was terrible prior to this period of time. Before the 1970s computing was very expensive, like things we've seen in the tour here [at the Museum]. It was in the back room and it was very limited and it was not online.

Schuster: And it was guarded by a bureaucracy.

Held: That was amazing.

Grad: But a lot of DEC PDP's had been sold by that point in time. A lot of Data Generals had been sold.

Schuster: Yes, but those were really in engineering. Those were the precursors to engineering workstations in a way. They were really for calculations -- there wasn't a lot of data processing being done.

Lindsay: Remember even the earliest systems wouldn't run adequately with less than a MIP and a Meg and Data General didn't have that. The PDP-11 didn't have a MIP and a Meg. The DEC-10, yeah that was a machine but that was a mainframe in those days.

Schuster: But the first implementations in those the market was infinitesimal because the products were weak.

Grad: Okay, so you had this opportunity. I was wondering, one of the things I was trying to explore is to what extent the lack of foresight by the database management companies were locked into the mainframe; they were not seeing what's happening here; you opened the door and, as often happens, the young entrepreneurs, I know you're not quite as young as you were then, but the young entrepreneurs come in. They create something and then they, like in your

cases, you sold the hell out of it. You really did.

MacDonald Stu [Schuster] makes a very good point here though. We sold the hell out of it and there was more opportunity because it could become more pervasive. The boxes we were selling them on could be more pervasively deployed in these organizations than the mainframes ever could economically.

Grad: So instead of just selling to the glass houses you had everybody buying.

Schuster: What blew me away were the multiples. You think about departmental computing and think somebody is going to build a specific solution, but often these applications were sort of like horizontal solutions, to work across departments. Even though they may have had a certain departmental flavor, the mindset was that there were eight departments that were going to be doing the same things. They were building for this distributed manufacturing or this distributed telecommunication application so they weren't building it for one box. They were building it to deploy it. That's where the deals came from. They were going to deploy this ten times or even going to deploy it 100 times.

Grad: Every branch or every whatever.

Bob MacDonald Deployment was where we made huge money.

Schuster: Yes.

MacDonald There's a pervasive idea here: the silos of information in these organizations. We helped create that. Because prior to the pervasiveness of our software on all these boxes they might have had a single silo because that's all they could afford.

Lindsay: Oh, yes.

Schuster: Right.

MacDonald And with us, all of a sudden, there was the manufacturing silo, and human resources over here and things like that. We helped create that mess.

Grad: I have four questions on this as to the things that were most important. I asked about the competitive evolution, the platforms. You made the point that Moore's law applied to the platforms, made a hell of a difference in terms of what you were able to do and what you were able to sell. And for the usages, you said that the number of backlogged applications you

could use it for, all kinds of things at a local level, didn't have to wait for the glass house. Customers were opening up new departmental machines, new people who hadn't bought computers or used computers before. It wasn't that there were new classes of customers. It was still the same companies in many cases. The question was asked before was whether you weren't in the drugstores or the small companies. And you said that it was rather that you were in departments of big companies. Is that a fair statement?

Schuster: Right.

Hoffman: Definitely.

Grad: So that deployment approach causes the big multiples. You're not selling "onesies." You're selling 10s and 20s and even 50s.

Hoffman: We were talking about this yesterday and we did a lot of seminars around the country and you'd go to a town and announce what was going on. You'd get hundreds, not like five, ten, fifteen people. You'd get hundreds of people coming to learn about databases, how it worked.

Sippl: It was the intersection of the fire in the valley phenomenon with people's desire for liberation, freedom. That was absolutely it. Those were the two driving forces.

Relations with Universities

Schuster: One thing I was going to add; the other phenomenon was that universities were finally cranking out computer scientists and business analysts out of MBA schools in large volumes; so there was this group of people that were capable of understanding this and saying, "With four or five people I could build a pretty impressive breaking point."

Codd: Yes.

Grad: The last, the fourth thing I had there that has come up, the technology was evolving during this period of time as well so those are the four things that I've heard you all discuss as what was taking place that had helped to drive this business. You also added one now that I hadn't thought about, that there were a lot of available, qualified salespeople and I hadn't thought about that as being a factor. Was that significant?

MacDonald I just remember for our company it really helped because when you're trying to maintain those growth rates you need to grow your field organization and there's a big

difference when you've got a bunch of experienced regional managers, people that knew accounts, knew the whole database sales cycle. It enabled us to take raw recruits, get them up to speed more quickly. We had some key senior executives. The guy who opened up Asia for us had worked at Cullinet so he knew the whole market, knew all the distributors and that was a remarkable turbo thrust.

Grad: How about international, was that a major thrust as well?

MacDonald Very early.

Codd: Absolutely.

Haigh: Tying in with that, were you making an effort to get your specific product into universities so that the computer science geeks who were doing database courses and other people working with them would be using Oracle, would be using Sybase?

Jacobs: We didn't really.

Grad: There wasn't any money there.

Schuster: Actually we had the Sybase Laureate program. It wasn't to get it to the students but it was to get it into universities. We made it so that the license fee was a fraction of the normal license fee, but they had to pay real maintenance. It did make some inroads, but there were a few really important, visible applications. For Sybase, the human genome project was one, and we also ended up winning the World Cup project in 1990 so there were some of these things we were discounting under a special charity program or a human benefit program. The idea was that exploiting those gave us a lot of visibility. But none of us did the Apple thing. None of us were giving stuff away to universities.

Hoffman: It's a good idea though. We'll do it next time.

Bruce Lindsay: Well, the DB2 scholars program was the IBM program to give a free version of DB2 to the universities; but in the early days they didn't have mainframes in the departments, so they could have all the software they wanted but they couldn't run it. This program has really never been very well publicized to tell you the truth.

Codd: I wasn't referring to that. I was referring to years back when IBM gave schools very large discounts. You were around.

Schuster: Yes, we had a 60 percent discount for the computers.

Codd: Right. This program ended around 1970. So back then everybody coming out of universities knew IBM equipment.

Grad: I wanted to move ahead. Mike, did you have a point?

Mike Humphries: Yes, someone made a comment about the sort of windfall effect of people coming out of companies that had a lot of experience and how that would help you take a step up. In the 1970s I was involved in the timesharing industry. There are a number of people here that were involved too. We did a really good job of training people all the way from sales to first level management and so on and that's because the growth rates were very different than what we're talking about here in the 1980s in the relational area. It got to be a point and we'd made this comment internally at Oracle. I'm sure Ken [Jacobs] remembers this; if we'd grown at 80 percent instead of 100 percent we could have managed a lot of things that we had to do a lot better. But we tried to keep up with the demand for salespeople by having sales training, but it got more and more rudimentary as time went on and today, so maybe I'm becoming an old fogey now but I look at the kind of salespeople that you see today that are in all these companies that are trying to sell to the enterprise and they don't know very much about selling to the enterprise. What they learned, they learned through going out in battle and either surviving or not. Companies were not training. We went through in the 1980s the last true successful efforts to get a whole sales force and first line managers trained to do a really good job. I see the effects today of companies trying to scale with less resources on that and you end up with people making huge sales mistakes and strategic mistakes and making assumptions. That's what I've seen.

Grad: Even falsifying revenue and things like that. None of you would ever have done that.

Humphries: That was creative work. You actually get credit for that.

Mergers and Acquisitions

Grad: Let's move ahead. Let's now look into the 1990s and what's happening in that period. There was a significant change. Some of the companies that were doing well in the 1980s started to run into a wall at this point in time. Is that correct? Roger, what's happening in the early 1990s?

Sippl: Well, I did that acquisition in 1989 and that sort of messed things up for a little while. We failed to come up with our graphical 4GL product which would have been great. But

the OLTP developments that we had been working on for a long time those came out extremely well and so I was burnt out. We brought in some new management and Phil White was able to take OLTP products and build a tremendous growth business through the 1990s.

Lindsay: Are you referring to the Illustra acquisition?

Sippl: No that was our own in-house development. It was actually Gary Kelly and a group of about 20 people up in Portland.

Jacobs: But the Kansas deal you did was where things started going south.

Sippl: Kansas was the off shoot of Mason stuff and that didn't work out, but our OLTP database stuff turned out so well that we were able to turn around from our miscue of trying to integrate office automation documents with the database. That was all broadly abandoned and just the growth of the core database business based on our own internal development is what drove the revenue from 100-some million to close to \$1 billion.

Grad: When are we talking about? What timeframe?

Sippl: From 1990 to 1998 revenue went from \$100-some million probably to \$700 million or \$800 million.

MacDonald I think the real power curve in there was 1992 to 1996. The Illustra acquisition was at the end of 1995. It was December of 1995 because we announced it right then and then as we went into 1996 Informix was at its zenith.

Sippl: I had left Informix and I had actually gone on the board of Illustra and we coined the term object relational database. Mike Stonebraker wanted to call it abstract data type database but that didn't quite work. So we came up with object relational and that was the database for cyberspace. I think Bruce Golden coined that phrase and I thought that was hot. I think when Informix was trying to buy Illustra I kept getting phone calls from Dick Williams at Illustra saying, "Phil has offered 200-some million dollars; should we take it?" I said, "That sounds like a lot of money. You should probably take that." And then Phil was going, "Gee, they're not taking my offer. How much do you think it will take?" And so I kind of got out of the pricing thing but they got up to like \$420 million, \$480 million, something like that.

Grad: That's not chump change is it?

Sippl: It was amazing for a company that only had \$5 million or \$10 million of revenue. I

thought it was a bit much.

Grad: Ken, what was happening in Oracle during this time?

Jacobs: I just wanted to ask Roger one question before I address that. Where was Red Brick?

Sippl: Some of our people had left to start Red Brick but I lost track of that. Bob probably knows more about that.

MacDonald It's vague in my memory.

Sippl: Did we buy Red Brick I mean after I was gone? Long after I was gone there were several acquisitions in there but it was after my time. Bob was around.

MacDonald No, and then I left and there were a lot of acquisitions subsequent to when I left.

Grad: Informix is bought in what year?

Sippl: IBM bought Informix.

MacDonald They got Informix' database business.

Sippl: So from some other company that Informix bought that guy became the CEO for a while and that guy sold the database business to IBM for \$1 billion cash, which none of the shareholders got as best I could tell, but I didn't own any stock. I wasn't as focused on it as some of my friends. But then they spent a lot of that money trying to become an Internet software company or something like that. And then inevitably they then sold themselves to IBM I think for another billion dollars, which was the same billion that IBM paid them. So essentially whatever business they were in was apparently worthless because they only got the one billion for it.

Bohl: It was another billion dollars.

Sippl: Well no. See, they had a billion cash from IBM, so they brought the billion down to \$600 million and they got bought for \$1 billion, so if they would have just distributed the billion they could have short circuited this whole three or four years of the money to Sybase.

Grad: What happens to Sybase during this period?

Hoffman: In 1990 it was \$100 million and by 1995 we were just short of a billion dollars so it was just incredible growth over that period of time. It was mostly internal growth but there were some acquisitions that went on, a middleware company.

Growth and Problems in the 1990s

Grad: I'm trying to get a sense of what was driving the growth during the 1990s. Was it the same things that were driving it during the 1980s or was it now acquisitions? Was it a different ballgame in the 1990s?

Hoffman: It was mostly internal growth.

Grad: How about Oracle?

Jacobs: Yes, it was just amazing growth during that time. We saved the company after the financial problems in 1991. Then we came out with Oracle 7, which cemented a technology position that was unassailable as far as the rest of the industry was concerned. To be fair we had some help. Our competitors made some mistakes; you guys had problems at Sybase with reliability in System 10 and so it was an opportune time for us. We just took off.

Grad: But Sybase still grew to \$1 billion and yet you say they made mistakes. That doesn't sound like terribly bad mistakes.

Jerry Held: But that was the period of time where some of the wheels came off, first at Ingres then at Sybase, and then at Informix; and so by the end of the period there was really only Oracle left in terms of independent database companies that were really successful.

Grad: You're talking about the end of the 1990s?

Held: Well, 1998 or so.

Jacobs: Yes, 1998.

Held: And it was a vicious cycle. I was in the middle of it there at Oracle, but it was not a very pleasant environment because it was so directly competitive. It wasn't just ads.

Schuster: It wasn't enough that you won but people had to lose. Yes, it wasn't just ads. The ads weren't to let me show you how my product helps you solve your business problem, Mr. Customer. It's let me tell you how much better I am than the guy down the street to the point of

taking out billboards.

Sippl: Billboards, billboards were fun. That started in a lighthearted, spirited sort of thing.

Schuster: Until the various issues that came up for each of the companies. An awful lot of the growth in the 1990s was from customers beginning to deploy what they had built. These large deployments were baked in a year or two before and then the deployment created growth. Then the whole application thing came in, where the applications on the database were starting to drive the industry and that increased the markets because now you had standardized applications as opposed to people rolling their own to deploy. So there was still a lot of growth. I have to give Oracle a lot of credit because to me they looked like they were really, really vulnerable, but they got their customer support act together. They got their financing act together and they got their product act together and the rest of us made a few mistakes.

Ingres in the 1990s

Grad: Marilyn, what's happening in Ingres during this period of time, in the 1990s?

Bohl: Product wise, I agree with Stu [Schuster]. Tools were always important at Ingres and we had a new tool called Ingres Windows 4GL which took advantage of Windows, and got additional revenue. One of our key customers with Ingres Windows 4GL was ASK and that was Sandy Kurtzig. She had manufacturing applications that ran on HP and DEC proprietary so she was worried about that market and Ask then acquired Ingres.

Grad: When was that?

Bohl: 1990.

Grad: So that's at the very beginning of this time period.

Bohl: It became ASK Ingres.

Grad: Now, how did Ingres do once it was acquired by ASK or shouldn't I ask?

Bohl: Yesterday afternoon Larry Rowe upstairs said Ingres was the major part of the combined ASK Ingres company revenue, but there were some mistakes. The ASK sales force knew how to sell to the manufacturing people in the company and there were some efforts to have those people sell database and to have the database people sell the manufacturing

applications....

Jacobs: It seldom worked.

Schuster: Yes.

Bohl: And then she brought in a fellow from Italy, Pierre Carlo Felati and that was disastrous.

Grad: How long were you there, Marilyn?

Bohl: I was there from 1989 to 1994. Greg Batti who was here yesterday and I left shortly before CA acquired Ingres.

Schuster: I think they almost became a non-factor.

Grad: Did you pay any more attention to Ingres?

Sippl: It fell off the radar after the ASK merger.

Grad: Did anybody else come onto the radar in the 1990s?

Schuster: One or two entered the market but none were a big factor.

Sippl: No, not revenue wise certainly.

Schuster: They were just noise.

Lindsay: The big takeoff was the warehouse vendors coming into this space. Growth moved away from transactions.

Grad: Were they taking business away from you?

MacDonald No, that was minor because there were fewer users. The thing was that although we got a fair amount of business from data warehousing, it wasn't as pervasive a deployment because you didn't have dozens and dozens of sites where they were getting deployed, so it was a nuisance competitively but it wasn't like a significant business.

Microsoft as a Competitor

Schuster: Probably the most significant thing might have been the Microsoft SQL Server.

Grad: I was going to ask you. What happens next? When does Sybase make a deal with Microsoft?

Hoffman: In 1987.

Grad: Okay and now in the 1990s the SQL Server is being marketed and pushed.

Hoffman: On the low end we were still working together.

Grad: That's my question. Was that impacting any of your sales?

Hoffman: No, no.

Grad: Why not?

Sippl: That bothered us. That bothered me both strategically and tactically. I don't know how much revenue we lost to it but we had a low end database engine, our original Informix SQL engine. When we came out with Informix Online it was a completely different product. The Informix standard engine as we called it was very easy to install. I mean it's very similar to My SQL and similar products. I mean it would be a valid competitor against My SQL. In fact, after I left Informix I tried to buy the total rights, non-exclusively from Informix because I just thought that an easy to use database that ran pretty well on a small amount of hardware was probably still pretty interesting to many people.

Hoffman: But we never competed against Microsoft, no. It was just totally complementary.

Grad: So Oracle actually had a product on Windows before Microsoft did, but with minor revenue?

Jacobs: It was minor revenue and we didn't have much of a PC sales force. We were targeting larger organizations and we didn't work very well through partners so we didn't have a channel to a lot of these Windows customers. But once SQL Server came out on Windows, it was a horse race and pretty soon Microsoft leveraged its position and pushed us down.

Schuster: Especially in the small business and distributed processing area. But I think it's a

\$1 billion business for Microsoft.

Jacobs: Yes, yes.

Sippl: I'm surprised it's only \$1 billion business.

Schuster: It may be more.

Sippl: I still believe in Moore's Law so I thought that was the kiss of death inevitably for the rest of us that they would start eating into our market share. They haven't done as well as I thought they would. Oracle held them off.

Grad: They don't have your sales force.

Sippl: I'm sure that's part of it, the style of selling, the focus on it. I mean for Oracle it's life and death, not so for Microsoft.

Jacobs: Also, I don't think they actually understood enterprise sales.

Schuster: No they never did.

Jacobs: Their idea of enterprise computing was the client PC used by the enterprise user, but that doesn't lead to scale. They didn't get security. They didn't get a lot of those things.

Held: It's a little bit amazing since they hired an amazing talent pool when you think about the people they hired from IBM, from Oracle, Tandem, from every place. They got great people to go up there and yet after all these years the product still is not a competitive high end product.

Grad: Let me suggest the difference is the point you're making. You relational companies thought about a particular market and use and a way of doing things. Microsoft's mental focus is on the desktop.

Hoffman: They're a shrink wrap company primarily.

Schuster: As a departmental server they are now successful but it took them a long time to get there.

Grad: Successful compared to Oracle?

Lindsay: It's quite a different mindset that they seem to have. If you got trouble with your machine, re-boot it, and the trouble goes away. That's sort of the Windows mindset. I don't know how many times I phoned the help desk and I would say, "It's not working" and they say, "Boot, it'll work." I say, "But I don't want to boot." And they say, "Well do you want it to work?"

Grad: Okay, we're coming to the end of the 1990s now.

IBM in the Marketplace

Haderle: But you haven't asked about IBM. You asked about all the other vendors but not about IBM.

Grad: What was happening at IBM?

Thomas Haigh: I want to know, I mean in the earlier sessions every time I've asked people about competitors, right, in the early days everybody had their niche. Oracle started off well on the VAX, Informix on UNIX in general, Sybase with financials and high end. IBM was obviously mainframes. And what I really want to hear about this period is how do you start thinking about your business differently and who your competitors are and what you have to do differently when you reach this 1993 to 1995 period where you're all serious competitors and you're all going into the same market and you're all on UNIX.

Haderle: In this time period, IBM is growing on mainframe like crazy. By the time we hit the mid-1990s we're a billion and a half dollars in revenue on DB2 on mainframes and database on the AS/400. There are more copies on the AS/400 than there are hairs on your head. So there are just billions of copies of this thing. So the mainframe is just selling like crazy and the mainframe itself is reinventing itself. It was on bipolar technology which has got a trajectory curve of price that is increasing and CMOS is decreasing and so they reinvented themselves onto CMOS technology. This made the IBM mainframe still competitive in terms of what they needed to do in the marketplace. Then we reengineered DB2 against that particular environment, which again makes it take off.

The next big thing was that a software business was created inside of IBM. A little software business was created with Earl Wheeler in 1987-88 where they gave a little bit of software to it but it was still a hardware firm. And then in 1991-92 it was really made into a larger software business, really aggregating almost all software. And then when [Lou] Gerstner came in around 1993, boom, it came in as all software, meaning all software reported into Steve Mills and it was measured on a separate balance sheet than the hardware business. Gerstner looked at all the

growth on the industries and saw that he could get good margins off of hardware, but it was declining. So you better invest somewhere else. That's where things took off for us in terms of expanding. It was a transition to a software vendor which allowed us then to go in and take some money and invest against other platforms, open systems, against Windows platforms, UNIX platforms, on a you name it, something other than an IBM platform.

We invested whatever we needed to do to grow the software business and that's where the open system database got going. Now we're late to the market, right? We're late with technology. We're really in deep "doodoo" because we're about ten years behind; in fact depending on how you're counting we're 12 years behind. We're way behind. So we built our own product. Really, really, really important in that whole scenario is that not only was IBM given a software business but it was given a direct sales force, so Steve [Mills] had his own direct sales force. We could go in and make something successful and we didn't have to count on the wider IBM because the wider IBM was still going to make their money off of the hardware because that's where the margins were still going on, so a direct sales force went in and created the open system DB2 at the end of the 1990s, being late to the game. Hard as you try, the real game was not the creation of the database. It was the recruiting of the VARs and so we'd end up going against Oracle and we didn't have the applications because they had the VARs in that particular market. You'd be in Guatemala and there'd be a different VAR than there would be in Switzerland, than there would be for doing the same damn thing, right? And so getting those VARs over onto IBM you basically had to pay them because Oracle had the market. Well, I mean there's not like tens of them. There's like hundreds of thousands of them. So buying Informix was buying an installed base with a set of well-known VARs that were already lashed up. It was buying that ecosystem in there. This was the end of the 1990s. We had shown the growth on the database to Gerstner, that by golly we could run the business and grow the business, not only on mainframe but off mainframe and so basically he gave us \$1 billion, which if you know Lou, after getting \$1 billion out of Lou, you better give it back real quick. And so buying Informix was buying an installed base to be able to grow, not just to sell the database, to sell the rest of the IBM portfolio of software because it's way more than database. This is how Steve has grown that business.

Schuster: Yes, IBM acquired a software company for the best application development tools and Tivoli for a great set of application management tools, and these were really important strategic moves in that whole ecosystem because the rest of us had to depend on other people. We had them. Everybody had them but we didn't have them to the extent that those were the market leading products.

Haderle: So that was up until about 2000. Yes IBM could do acquisitions but you all know how hard it is to integrate an acquisition with the people on the culture end and then add everything in. But they demonstrated that the software guys could do it. If you look there's an acquisition a week that goes on practically out of IBM--that's how they're growing their

business. Acquiring Essential was not because it was a dog and pony thing. It was in the warehousing business for doing cleansing and moving data from point to point. And rather than absorbing that all in one shot with Informix, no let's grow the database and show that we can really absorb that and grow that business. And I don't just mean the database guys. I mean the software group can grow that business. And then it opened the door for many, many more acquisitions.

MacDonald Don, I'm curious, having been ex-Informix, what happened post-acquisition? How did you treat Informix versus DB2? Was it to merge as quickly as possible to run them as separate businesses? What did you wind up doing?

Haderle: You have to merge them together to make the numbers work out. I mean you've got to merge them. You're paying a premium on this thing and then in any one of these acquisitions you got to get merge staffs like the marketing staff and others to reduce costs.

MacDonald Yes.

Haderle: And then you got to make sense to your customer set. Informix had nine databases when we bought them. We won't go through all nine but there were nine databases and then trying to rationalize this to your customer set where you've got your own nine databases and now you've got 18 databases to rationalize. You've got to rationalize or you get conflict in the channels in the market all over the place. There were a lot of hiccups in terms of the rationalization but it was really settled on IDS. Ignore the rest of them. We can have a long discussion about every individual one. Each has its own little business right in there, right, so there were a couple of them had their islands of business, but then the mainframe one was IDS and how do you rationalize that into the DB2 set? And there were a number of hiccups in doing that because you couldn't rationalize. It was too hard to rationalize.

The Relational Marketplace in the late 1990s

Held: That points to an interesting transition that happened at the end of the 1990s as we get into the last six or seven years, is that in the enterprise software business in general and in the database and applications business the growth has slowed and this consolidation has started to happen at a very, very rapid pace and one of the keys to success now is to be a good acquirer and the ability to do exactly what Don was talking about and bring in a company and get the best leverage out of it is the new paradigm.

Grad: So who's there? Now we're at 1998 or 1999. Who's in the ballgame at this point, Oracle is certainly there, now major stuff on applications by this point in time?

Jacobs: Yes, sure.

Grad: Who else is there, Sybase is still there?

Hoffman: Sybase.

Grad: And are they still doing relational? Is that still their basic business?

Hoffman: It's probably the bulk of the business.

Grad: And then how big is it? A billion dollars a year?

Hoffman: Eight hundred million dollars.

Grad: Informix has now been bought and is part of IBM.

Haderle: Microsoft.

Grad: Ingres.

Bohl: Ingres spun out of CA as an open source database.

Jacobs: When did that happen, Marilyn? That was later wasn't it?

Grad: I'm talking about 1998. Who's in the ballgame still? Is CA in the ballgame at that point?

Jacobs: They have Ingres but they're not doing anything.

Grad: They're not significant. They would just do maintenance. Who else is around?

Held: IBM and Microsoft.

Haderle: Teradata.

Jacobs: Teradata actually went into a decline for a while because they were perceived as being very, very expensive.

Held: They were part of NCR.

Jacobs: They were part of NCR, which was part of AT&T and they went into a decline.

Haderle: But they were on their own homegrown hardware base right?

Jacobs: Right when they first came out, yes.

Haderle: And they ended up moving NCR to try to go to somebody else's hardware base right? And then NCR just lost it.

Grad: Any new player at that point in time who was significant? You mentioned Microsoft. How big a business is it now at the end of the 1990s?

Jacobs: You can go to IDC and ask. I mean they have all that.

Grad: Twenty billion dollars, \$25 billion, not that big?

Jacobs: No, not that big.

Held: No, ten or 15 billion dollars.

Haderle: Not for pure database. I mean if you're going to take all the applications and all the rest of them then it is a different number.

Grad: Don, you're right. One of the big drivers during the 1990s was that applications are being built and they're pushing the requirement for the database budget. PeopleSoft though stays out of the database, relational database business right?

Hoffman: True.

Grad: That's strictly an applications business. SAP stays out of it. They're strictly an applications company. Microsoft is in but it's small potatoes, right?

Jacobs: Well actually they didn't get into business applications until very late and on a very low end.

Grad: Relational is very small.

Jacobs: Yes.

Haderle: Actually, SAP had their own in-house database that they just never commercialized in that era and they embedded it and sold it inside of Germany.

Jacobs: A tiny percentage of their business.

Haderle: No, it wasn't, but they chose not to do follow that route. The point is that they had their own technology in-house.

Jacobs: SAP worked on Oracle though and certainly as you get to the higher end it was virtually 100 percent Oracle.

Hoffman: But Software AG was a small company in Germany and they were a database company.

Grad: Was it Adabas?

Luanne Johnson: Software AG is still in business with Adabas.

Jacobs: They went to XML. They became kind of XML centric.

Haderle: But they're huge in the install base for SAP in Germany and so SAP has invested in them to keep that database alive.

Jacobs: What they did was they acquired the rights to Adabas They branded it SAP/DB and then they subsequently did this deal with My SQL to open source it and I don't think there's much of a future for it.

Haderle: There isn't but they still have a hell of an installed base.

Jacobs: Well when you say a hell of an installed base, I think the number is just like two to three percent of the SAP base.

Grad: Are there any other significant database players left, relational or otherwise?

Schuster: It's a middle market with an installed base which lasts forever.

Open Source

Jacobs: Well the most interesting thing is the open source world and that's post 2000 really and we've got Ingres which is now open source and My SQL and Firebird. It's interesting because earlier we were talking about getting to this new market and these new customers and ease of hardware acquisition and lower cost and these guys are doing to us what we did to IBM.

Grad: Is this the puncture of the balloon?

Jacobs: I don't think so.

Schuster: We were talking about that last night.

Jacobs: Yes, I don't think so. I mean I'm personally very involved because of my work. I run a group at Oracle. It has an open source database component and so my sense is that there's a real difference between enterprise business and the broad website kind of guys. The technologies aren't there and these enterprises want real scale. They want companies behind them that can be there to support them and so forth. I think the whole notion of open source is evolving. People are kind of figuring out how to monetize their IP and the more they start to look like commercial companies, the less significant the open source stuff will be as alternatives to the established players. It's very different from what happened with Linux. All of the community centered on a single code base, around Linux, and we got major players like IBM and Oracle and others supporting Linux per se. That just isn't happening with respect to these open source databases.

Grad: How about the rest of you. From your knowledge of the field do you see it as a problem, the open source stuff? Do you see anything right now that says you're going to be like the old database management companies in the 1980s who didn't see what was happening to them?

Sippl: Well the price point on software has always worried me because we just made it up, right? Is it one hundred grand or is it ten grand or \$1,000, whatever. So I always saw it as not a scam exactly but you are just making up a number. Oh, how much is it for 42 copies of the database on these?

Schuster: Well it got to be where the competitive situation kept the price down in large deals. With the competitive nature of bidding, the smart buyers would at least pit us against each other. And frankly there was a sales strategy that kept the prices down altogether. If you're going to lose a deal the best thing you can do is chop price and make the competitor suffer.

Grad: At the worst it'll cost them money.

Jacobs: One thing Oracle has done in response is to add options to our database so it wasn't just the core database. It was the special function that was an add-on premium priced product.

Hoffman: Microsoft is still definitely creeping up into the larger market. I mean I run a new company and we're doing some pretty high transaction rates with those guys.

Impact of the Internet

Grad: Has the Internet affected the relational business, in a positive or negative way?

Schuster: Oh, it's a huge, positive, a huge positive. It allowed the growth from 1995 because the number of people who were buying databases to build Internet-based business was humongous. It really fueled tremendous growth.

Grad: The dot com thing, didn't that hurt you?

Jacobs: Sure, we were hurt when it collapsed.

Schuster: Sure.

Sippl: But when it was booming in the late 1990s it was a nice wave to ride.

Jacobs: And it was almost all Oracle. I mean I don't know about your perception, you guys, but if you were starting up a dot com company you'd buy Oracle. You could afford it. The VCs would give you the money. You go with the name brand, boom, you're done. That's how we got into eBay and all these other companies.

Held: It also did an interesting thing from a technology point of view. If you looked at the early database it was big mainframes. If you look at the growth that's spawned all these companies in the 1980s it was the distributed systems and those mini computers and the PCs. And then what the Internet did was it was a recentralization and if you look at the servers these are massive, massive, highly parallel databases that are recentralizing data. It's kind of gone around in a big circle and we're back to what's the modern day mainframe running these massive databases.

Grad: The Worldwide Web, did it have a plus or minus effect in terms of your sales

directly?

Jacobs: As opposed to the Internet itself, you mean?

Grad: Can you separate those two? That was what I was asking.

Jacobs: No.

Hoffman: Not really.

Lindsay: Certainly to the degree that the Internet commerce has increased the number of transactions that companies do, those transactions all have to go through a database, the aggregate worldwide number of transactions go up. Databases win.

Grad: I guess in my mind I separate the communications that the Internet provides versus the transaction things that are happened because of the web.

Jacobs: From a technology point of view clearly we went from client/server to web-based inside the enterprise. Then you add on to the web to do commerce. I mean Oracle certainly rode the boom of e-commerce. IBM created the term and was out there talking about e-business and Oracle just latched onto that and marketed the hell out of it, so we were successful at getting a lot of this e-business.

Held: There's another thing that's happened; another full circle. Look at the relational database--it started with a lot of decision support stuff but moved to transactions in the late 1980s and especially the 1990s. It was all OLTP, bring up the big apps, put up SAP and all those things. But now, in the last several years and the next several years, it's a lot of decision support, data analysis. Part of this is driven by enterprise stuff and part of it is driven by the Internet where you're analyzing what people are doing.

Humphries: You asked about how long this can go on. I think Larry Ellison is planning on another 50 to 100 years. <laughter>

Schuster: Well, I think the database portions of the business today are dominated by professional services and install based maintenance. The rush for new licenses has definitely slowed. Now Oracle's growing through acquisition and applications. The other companies are living off of installed bases and such. So the heyday of the growth rates, it's over. There's just no new technology to cause a fundamental change in the use of this.

New Technologies

Jacobs: Well, at the same time, there is new technology. I mean, there's a lot of innovation happening in database today. Whether it's in the open source world of companies like [Michael] Stonebraker's Vertigo or others, it's remarkable how much new stuff is happening at a technology level in database.

Schuster: Well, there is the stream technology happening...

Jacobs: There's stream but in terms of a shift of a model, we all looked at the early 1990s. Never, ever, ever go away from relational.

Sippl: I disagree with you, Ken. Every day, I look for the new database model.

Jacobs: So we all looked at Object when it came in the early 1990s. As a company, we invested in somebody just in case our forecast wasn't quite right, so that we could switch to that horse, okay? Or we brought a little something in house but it went away, without a long discussion about why, but it went away. And then we're all, you know, looking in the rearview mirror now with XML. We could have a long discussion about will it, will it, will it, no, no, and we all have an investment going in house. Now, the investment most of us have going on in house is not a pure XML database, Bruce can argue, but it's not a pure XML database, it's more akin to what Adabas did, you know, which was to add an SQL interface on their engine and hope the thing goes away. So most of the XML stuff is just kind of a paste on to your existing engine and hope you can satisfy this little market as opposed to it being a big shift that's going to happen. Everybody's still looking for the shift. The shift's not there and there's this investment against XML, which is this potential shift and I don't see something else looming on horizon in terms of yet another shift.

Held: As far as the core structured data of an enterprise, I agree. Never is a very long time but, for the foreseeable future, the relational model seems to have withstood the test of time. It seems to be a model which is going to store the bulk of enterprise structured data for the foreseeable future and there will be things around the edges. There will be XML and there'll be some objects and other things and then there's this other massive thing that's happened over the last many years, which is the unstructured data. And if you look at what's happened with Google and text search and all of that, there's more data, by far, managed and stored and queried in unstructured form.

Schuster: Relational databases are playing a role there but they're not the repository of record.

Sippl: And my guess would be that those unstructured storage and retrieval techniques will become more and more sophisticated and eventually usurp all of the functions that one needs for structured data. And you will use those styles of storage and retrieval for all kinds of data

Jacobs: No, I don't buy it.

Held: It is happening already in the BI [business intelligence] space which is the convergence from the query level, where BI is taken over. People don't write SQL any more to do queries. You're at some BI tool. There's a convergence happening very quickly of the unstructured textual stuff with the structured but, underneath, you still keep the structured relational data.

Sippl: I'm sure, for the rest of my lifetime, that's going to be how it is.

Held: I think you have a long life to go.

RDBMS on the Laptop

Haigh: All right, guys. You're wandering off into the future, which is always dangerous. There's another angle on these 1990s developments which I saw, at that point, as a user, how relational access and relational technology became ubiquitous. I'd like to hear people talk about. In 1991, I did my introduction to database management course and they had Oracle at the Manchester University computer science department. It ran really slowly and the poor machine was creaking under the weight and we tried to use the CASE tools but they just ran so slowly it was impossible and so on. Then, in 1996, I could run Access pretty well, with decent performance, real SQL, although it's not really client/server. And, from 2000 onwards, I've been carrying SQL Server around on my laptop and it's been running very happily. I used to have Cold Fusion on there as well. So, in that eight year period, it's gone from something that an ordinary independent developer is really going to struggle to have access to, to something that now, theoretically, runs on a pocket PC and, you know, what did that mean for all of you? But you've all been talking about getting more into the enterprise market and the high end stuff.

Jacobs: Well, there has been an important requirement that we make our products easier to use, more self installing, and fit in smaller environments. Oracle came out with a free product in the last two or three years called Oracle XE that's one button install and self managing and nice, user friendly thing but a lot of that came from the Microsoft desktop orientation, kind of making stuff digestible by ordinary people. MySQL has done the same thing to kind of make it really brain dead simple.

Schuster: I'm involved in a company that's targeting the embedded systems market with SQL, total development environment streams in and out for purely embedded applications for handheld devices. It's being used in set-top boxes and also in infotainment systems, aviation systems, in automobiles. There are a whole different set of platforms that run those embedded environments that are not Intel based platforms. IBM is launching some new chips in this area and they're all multi-core chips. So we might see another change with these new platforms, but it's still the fundamentals of SQL with a few special things thrown out and things put in to deal with these environments. It's sort of a flavor as opposed to a whole new concept. But it's still ice cream.

Lindsay: I'd like to come back to the Thomas [Haigh] discussion of an RDBMS on every laptop. And I'm just wondering, what is the app? If it's organizing my photos, well, there's plenty of photo organizing programs that work pretty good and none of them use a database. I'm pretty sure that Google Picassa doesn't use a database to keep track of my photos that it stores for me. What's the app that's going to compel you to pay a dime to put a database on your laptop?

Mahoney: iTunes?

Lindsay: iTunes doesn't use a database.

Mahoney: But should it?

Lindsay: Well, I mean, first of all, this database cannot be very big because, otherwise, if you're really going to have a million songs on your PC, which is certainly practical, you're not going to be able to listen to them so why bother?

The Enterprise Market for Relational Products

Grad: I'm still back to enterprise. Is there something happening in enterprise that will change that requirement?

MacDonald I'm going to go back to Roger's thing about the unstructured versus structured. In the last three years, I've been working with a company that is feeding enterprise software solutions into corporations that are desperate to improve customer experience on the worldwide web. The customer experience issues for them are far more about unstructured than structured because the unstructured information and being able to index it and find stuff is a far bigger deal for them than dealing with the structured stuff. They perceive a crisis right now for improving customer experience. Structured stuff, they can find when they need it, and it's very discrete needs and it's usually post-sale. But, pre-sale, it's dealing with this unstructured customer experience. It's computational linguistic indexing of unstructured information. So we're creating

these intelligent indices and we're using searches.

Schuster: Are you using search criteria and structure kept in a database pointing to these different blobs out there?

MacDonald Yes, and we use an orderly database underneath to store our indices but it's kind of all hidden because the big deal is about our intelligent index. So we're storing our intelligent index in it. It's a huge deal, these are million dollar deals.

Jacobs: What I think you're going to find is that high value structured information will go into databases.

MacDonald Absolutely.

Jacobs: For medical records, for example, being able to do analytics on images and things like that are of high value, that will happen. But the low value stuff like, you know, a Word document, isn't necessarily going to be in a database.

MacDonald Right.

Jacobs: The trend toward more and more unstructured data in a database is happening.

Meeting Conclusion

Grad: We're talking history, not the projections, but it's fascinating to see where you are at this point in time and what you're going to do. I'd like to thank all of you and I'll close in about a few minutes. I told you there was going to be a sales pitch before this was over so I do want to ask you a couple things. First of all, did you enjoy the sessions?

Everyone: Yes.

Grad: Did you learn something new?

Everyone: Yes.

Grad: Do you think it was valuable to spend this time together to do this?

Everyone: Yes.

Grad: You're not quite so sure, Bruce?

Lindsay: It was fine. <laughter>

Grad: We'd like to ask you to think about two things. One was suggested by some comments made last night at dinner and the other is my regional sales pitch. Of all the segments in our industry, this is a very unique and special one and the question that's come up is, would it be valuable, would it be worthwhile to have a professional historian construct and build a history of the industry on a full-scale basis? We have a tremendous amount of material already available that's been collected. The people are still alive, many of them, who did the work that made this industry so significant.

Jacobs: But we don't remember anything any more. <laughter>

Grad: Well, you surprise me, Ken. I was checking that out. <laughter> You are geographically relatively compact and that makes it much easier to conduct the research and to do the interviews and many of you still have materials or access to materials about what's occurred and what happened so we have original records. Historians want original material, not just what you think happened or what Joe said happened. You have a unique situation here in that, if you, as a group, all of you together, were interested in finding some way to make this happen, we would volunteer, as the Software Industry Special Interest Group, to help you make that happen, to even supervise the work if you like, and use the Museum here as a vehicle to help to pull it together. We could help you hire the proper historian, and that's very tricky. The joke is that if a historian does what you want him to do, you don't want him to do what you want him to do. Historians have to work on what they are interested and what their skill sets are. They would hire the researchers and get the thing published. So there's a proposition there. If you're interested, three or four of you talk to each other, get together, talk to me and we'll see how to pursue that.

The second is the obvious pitch. We like to run these things. We're doing this on a total volunteer basis. We get a relatively small amount of money from the Museum. The Museum has bitched to us that people will contribute money for hardware. They'll contribute money to buy a machine, SAP put a quarter of a million bucks up to bring a bunch of machines over from Germany. I really don't care a lot about machines. I care about software. I care about businesses. Those are where my interests lie. Maybe you're into sharing that interest. And, if you do, we're asking you to talk to your friends and others, help get some of the software people to support us directly. You can donate the money to the Museum and it's identified with us if you say so, and then we get it to emphasize the kinds of business history and software history that we believe is important and should be preserved...

Codd: Your first point, gathering up the history, really, in addition to what took place here the last two days, Chris [Date] and I have a friend who had an idea of writing a book about this particular market, the relational database market. He had our support and a number of other people. He went to a number of publishers. Nobody was interested. So, clearly, this is a problem.

Grad: We'll get it published. Just trust me. We will get that published.

Codd: The question that I have is really for everybody in attendance. Since you are holding the history, would you be willing to talk to this person and would you be willing to fund it?

Grad: No, I have no money.

Codd: Okay.

Grad: I don't have a nickel. The answer to the question is, if you guys want to fund a project, we want a historian-- if we're going to do what I said, we want a qualified, trained historian to do it. It's not a reporter, not a writer. We want a trained historian to do the work with trained research. It'll be done on a professional basis. That would be our interest. Other people can write on the subject for another reason but that's our professional interest. So, as far as number one is concerned, that's an offer. We have the skills and the ability to make this happen if you choose to do it.

Jacobs: What kind of budget are you talking about?

Grad: A quarter of a million dollars, I would guess. It depends how much is already here, how much has to be collected fresh, the research work, analyzing what's there. It's a major piece of work and it would require a good, skilled person who's very valuable to spend the time to do it but that's the ballpark, between a quarter of a mil and a half a mil, about a two to two and a half year period. These are no instant gratification things. It's not the quick book that's put out in six months. We would have no interest in that. If you want to do that, God bless you, but that has no interest to us.

Michael Blasgen: I have two comments. One, I think Roger should put another billboard up on route 101 that says " Informix Alumni donate X dollars for the relational database history project. Larry, what are you doing?" <laughter> So that was my frivolous point. Here's the second point, based on what Sharon said. There are two things that can go on here and definitely the history is important because, if you don't gather it, it's going to be gone forever but then you got to do something with it. Having it just sit around in a vault somewhere, to me, is not

very appealing and Doron [Swade], you're going to be putting together some kind of an exhibit in the future, right? So you're interested in how do you make this interesting to people that aren't currently interested. The reason nobody wants to pick this thing up and publish it is that they think nobody wants to buy it, right? Except for those of us in this room, who would buy a book about the relational database industry that's just cold and factual? But my belief is, there's a lot exciting stories. It's like a soap opera. And that's not making stuff up, that stuff's all real, it all happened, we all lived through it. If that stuff can be blended with the history and the technology, I think there's a really great story here.

Date: That was exactly the idea. There are many sort of popular science books out there. We talked last night about "Soul of a New Machine," that kind of thing. I would think this might be better than that one and there are many popular science books that sell pretty well and we have a big story to tell.

Grad: I'm not going to spend much more time. There's a third door I want to open. So I'm asking you, to talk among yourselves, a few of you, and, if you think it's worthwhile doing and you think you can put the funding into it, we'll take it on. Number two, please help us directly to whatever extent you feel comfortable. Number three, if you would like to have reunions, some of you have had reunions before, some of you haven't. If you'd like to have a reunion, this is a wonderful facility to do it in. We can combine it with history collection. We wouldn't just have a party but we can combine it with people doing videos, five minute segments, things about their recollections, things that happened in their company and this is a way you can introduce them to the Museum and help to collect history. We did this for Tymshare without doing that other piece of it, collecting histories, 70 people locally showed up. I'm sure any of your companies would get more than that to show up. People have fun. It's a nice thing to do. They get to see old friends. And I thank you so much for all your time and all your effort. This was a great session. Lunch is upstairs.