Department: Anecdotes
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Finding Software Industry History

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Cochair Software Industry SIG

Editor's note:
This is the last of three anecdotes in this issue about Burt Grad and Luanne Johnson's journey collecting and communicating software history.

Over the last twenty years, the Software History Center (SHC) and its successor, the Software Industry Special Interest Group (SI SIG), have collected, preserved, and communicated software industry history. We used three primary collection approaches: pioneer meetings, oral histories, and materials collection. For preservation, we have posted the edited transcripts of the meetings and oral histories on the Charles Babbage Institute (CBI) and the Computer History Museum (CHM) websites and archived our materials collections at CBI and CHM. Finally, for communication, Luanne Johnson created an SHC website that described and referenced every project that we did; and CBI and CHM set up their websites to access the finding aids for the collected materials and the edited transcripts. To communicate some of the information, we served as guest editors for nine special issues of the *IEEE Annals of the History of Computing* and encouraged publication in the *Annals* of 25 other software history articles from practitioners and historians.

Below are selected examples of our collection, preservation, and communication processes. In recounting them, I hope I convey some of the excitement I felt at the meetings, doing the oral histories, and producing the special issues of the *Annals*.

COLLECTION: PIONEER MEETINGS

Pioneer meetings were the primary method used to collect software history information. We held 14 of these meetings for software industry pioneers in particular subject areas. These are all listed in the SHC website referenced at the end of this anecdote, but here are some of my special experiences from these meetings.

ADAPSO

The first pioneer meeting was a reunion of Association of Data Processing Organizations

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(ADAPSO) members. It was held in 2002 and focused on the vital role that ADAPSO, as a trade association, had played in the growth and development of the computer software and services industry. This meeting was held in Washington, DC, where ADAPSO headquarters had been relocated in 1980 to strengthen its ability to lobby Congress and government agencies. This was the largest pioneer meeting that was ever held and was a special celebration of the history of ADAPSO with 44 former members and 9 computer historians participating, along with a number of the member's spouses. There was a wide range of workshops covering many of the areas that were the key interests of the members during the 1960 through 1990 period.

One of the sessions focused on the attempt by the trade association to stop banks from essentially giving away software services like accounting or payroll, as a way of attracting and retaining customers. The service bureaus who were trying to sell those processing services felt, with some logic, that this was unfair competition and that by not charging for these services, the banks were illegally competing, by effectively bundling these services with their banking functions. Unfortunately, neither the courts nor Congress agreed with the ADAPSO position, and this situation continued until the early 1970s, after IBM's unbundling of its software and services from the sale or lease of its hardware. This made software and services marketable, and the banks stopped giving away accounting services, apparently figuring that they would lose in court in the future.

Another session was on the industry roundtables that had been formed. These were in a legally tricky area, since companies that may have been competing against each other would be discussing their business plans and strategies. This could be considered industry collusion and therefore illegal. Milt Wessel, the long-time legal advisor to ADAPSO, provided rigid guidelines for these roundtables to follow to avoid behavior that would not be permitted, such as agreeing on prices or contract terms. Each of the roundtables had around 10–12 CEOs or presidents, who would meet for two to three days twice a year, to exchange ideas and have the other members of the roundtable serve as a sort of knowledgeable board of directors. Many ADAPSO members felt that these roundtables were the most valuable benefit they received from belonging to the association. Some of the roundtables continued through 2010, 30 years after they were founded.

PC Software Companies

One of the most memorable sessions of the two PC Software meetings that were held in 2004 was the workshop on PC spreadsheets with Dan Fylstra, CEO of Personal Software and later VisiCorp, facing off with Dan Bricklin and Bob Frankston, founders of Software Arts. Software Arts had developed VisiCalc, and Personal Software marketed it, and it had been responsible for the sale of many Apple II computers. The founders of the two companies told their often-contradictory technology and marketing stories about the growth and eventual demise of VisiCalc. We saw in our meeting the conflict of egos and business concepts—the disagreements between the developers and its marketer—that many industry observers felt had led to VisiCalc losing its preeminent market position to Mitch Kapor's Lotus 1-2-3.

Professional Services Companies

The professional services companies were an important, although less visible, part of the software industry. They had a wide range of business models. Some companies focused on doing programming projects for the large company commercial market using their own employees, while others sold their services primarily to medium-sized clients using independent contract programmers. The third category was what were called, pejoratively, the "Beltway Bandits," which almost exclusively did systems integration and programming for federal, state, and local governments. They became mammoth organizations and were typically an order of magnitude bigger than the other professional services companies, getting much larger, longer term contracts. We had three separate meetings for these professional services companies. One of the most interesting stories was how CACI had morphed from a company selling Simscript, a high-end simulation program designed by CACI co-founder Harry Markowitz's team at RAND, into a multi-billion-dollar company performing multimillion dollar contracts for the US military and a wide range of government agencies. One interesting aspect was that when CACI

or other companies doing this sort of business lost an ongoing contract after a rebid, they let go of all of the people working on that contract, and those people often then went to work for the company that had won the bid.

Relational Database Management Systems Companies

In 2007, we were able to bring together a top-notch group of people who led one of the most significant advances in the software products industry in the 1970s and 1980s. They were responsible for the introduction of relational database management systems (RDBMS). As a result of the technological advances by Ted Codd and others from the IBM Research Laboratories, a whole new concept of how to store and retrieve data was introduced. Relational database systems replaced many of the historic database management systems like IBM's IMS and Software AG's ADABAS. In the 1970s, these database systems together with data communications systems, particularly IBM's CICS, were called DB/DC (Data Base/Data Communications), and they had driven many of the new mainframe computer applications during that decade. While IBM did the technology foundation work, other institutions like UC Berkeley then made major contributions to broaden the use and value of these technologies. The first RDBMS products were introduced by companies other than IBM, for example, Oracle, Informix, Ingres, and Sybase. This was an example of how research organizations that created a new software or hardware model were often beaten to the market by newer, more nimble companies, not burdened by an installed base.

One memorable session at the relational database meeting was with a Senior Oracle Executive confronting the executives from its principal competitors from the 1980s, trying to explain how Oracle was able to announce the availability of a new feature or function within a few days of when the other companies had delivered it, even though Oracle had not even started development in many cases. These RDBMS companies also discussed the use of billboards on US 101 going through the heart of Silicon Valley to advertise new features and to sometimes mock and disparage the other companies.

Minicomputer Software Systems Companies

Most of the previous meetings had dealt with either mainframe or PC software or services, so we then decided to cover minicomputer software systems with leaders of the companies that provided software products or services for Digital Equipment Corporation (DEC), Data General (DG), and Hewlett Packard (HP) platforms. These meetings highlighted how difficult it was for these software companies to build and maintain effective relations with the hardware companies. The hardware manufacturers like DEC, DG, and HP were ambivalent about whether the software companies were vital to providing the systems and application software that the clients needed or whether these software companies and value-added resellers (VARs) were actually competitors because their programs would run on other manufacturers' hardware.

While many software companies or VARs supported minicomputers, they generally were small companies and they expected to make money not just from the application software they wrote for the minicomputers, but also often from selling the hardware and then installing and maintaining the systems. There was a dramatic difference in vendor relations in the DEC market versus the HP market. The connection was much closer and longer term with HP, in spite of HP's frequent missteps and inconsistent practices. The vendors supporting DEC did not feel that DEC treated them well or gave them sufficient credit or commissions for the sales of hardware that they made happen. Often the DEC hardware sales representative would undercut them and take away the hardware sale, particularly if it was a multimachine sale.

Service Bureaus

While service bureaus were the earliest type of business selling the use of computers for application processing and they were the companies that formed ADAPSO in 1960, we did not get around to having a pioneer meeting for those companies until 2010; and we paid the price, since by then many of the original company founders were older and unable to travel to New York City to attend the meeting. Nevertheless, we were able to get a few of the key players to participate and we were also able to

do oral histories by phone with some of the other founders.

They told an illuminating story of local businesses that eventually had to merge into regional or national companies to survive and then blazed the path for all of the later software and services companies. They often specialized in a particular application area, most often business accounting applications. ADP with payroll processing became the leading company in this category—one of the first to form this kind of business. One story told by ADP was that they used Volkswagen Beetles to pick up the weekly time cards from their local clients and to deliver the printed paychecks. Other service bureaus focused on serving a specific industry, supporting automobile dealers, country clubs, or other niche markets.

Desktop Publishing Systems Companies

One unusually productive meeting was on Desktop Publishing (Figure 1). This industry resulted from technological work at Xerox Palo Alto Research Center (PARC) and the founding of various, mostly west coast companies. Using a remarkable combination of hardware and software technologies, this new industry application segment developed independently of the mainstream software product companies with a quite different business model. We would not have been able to organize or plan or conduct the meeting if it had not been for Jonathan Seybold (Figure 2). Jonathan was the key to my knowing whom to invite and persuading them to come as well as structuring the agenda and asking questions during the meeting. The attendees considered Jonathan to be the industry guru. As came out during the meeting, Jonathan helped to define and evangelize for and promote the industry during its formative years.

This was the industry that eventually Adobe dominated through its own internal growth and from the acquisition of the companies and technologies that expanded Adobe's market and tied into the use of PostScript and its follow-on products. Adobe has produced and marketed software that everyone uses in composing documents to be printed or displayed on a computer screen. One interesting side note is that word processing programs, like Microsoft's Word, have incorporated many of the features that originally were only available for desktop publishing systems users.

AI: Expert Systems Companies

Our most recent pioneer meeting was held in 2018—on AI: Expert Systems. Many AI/Expert-Systems companies were founded in the 1970s and 1980s and had gone out of business by the end of the 1990s. The story at this meeting was of PhD's, principally from Stanford University, who

Figure 1. Burt and David Brock as comoderators of desktop publishing pioneer meeting May 2017. Photograph credit to: ©Douglas Fairbairn Photography.

Figure 2. Jonathan Seybold, Editor of The Seybold Newsletter and desktop publishing industry "guru" at the 2017 Desktop Publishing pioneer meeting. Photograph credit to: ©Douglas Fairbairn Photography.

created specialized companies, many of them focusing on a particular medical or other application area using Expert Systems to help solve a particularly complex problem. But only a few of these companies were able to extend their technology and programs to other application areas and so their growth was stunted and most closed down after a number of years. Again, we were dependent on finding an industry guru to guide us in planning the meeting and in attracting the participants. In this case, it was Professor Ed Feigenbaum of Stanford University, whom almost everyone in the industry identified as being the "father of expert systems." Fortunately, he was already deeply involved with the Computer History Museum and was most gracious in giving his time to make the meeting a success. The quality of the attendees and their technological skills were outstanding, including many participants who have made new contributions to artificial intelligence applications during the 21st century.

COLLECTION: ORAL HISTORIES

Another principal method that we used to collect software history was to arrange oral histories of significant business and technological leaders in the computer software and services industry. These interviews were originally conducted by professional historians although later on, many were conducted by Luanne Johnson and me. Luanne had also done several dozen oral histories on her own prior to the founding of the SHC and she donated these to the collection as well.

Among the oral history interviews, here are just a few of the people who were particularly well known in the industry during the 1960 to 1990 time period: *Frank Lautenberg*, cofounder of ADP and long-time Senator from New Jersey; *Dan Bricklin*, cocreator of VisiCalc; *Dick Case*, deputy to Fred Brooks at IBM; *Michael Stonebraker*, pioneer in relational database technologies; *Mitch Kapor*, founder of Lotus Technologies; *Jim Mann*, CEO of SunGard; *Gary Hendrix*, CEO of Symantec; *Sam Wyly*, founder of UCC and Sterling Software, *Dick Canning*, author of early computer business books and author/publisher of the *EDP Analyzer*; *John Cullinane*, founder of Cullinet Services; *David Duffield*, CEO of Peoplesoft; *Bernie Goldstein*, Chair of Tymshare and National CSS and then Managing Partner of Broadview Associates, which was the principal merger and acquisition firm for software and services companies; and *Tom O'Rourke*, CEO of Tymshare.

Alfredo Rego

Among the most interesting oral history interviews that I conducted was one with Alfredo Rego, a Guatemalan native who, through sheer guts and chutzpah, got his degree at the University of Texas in Austin and created a very successful software business supporting HP 3000 computers. He started the interview when I asked about his family by telling me that he was a bastard, literally. Let me tell you, that set me back and I was not sure what question to ask next. You would have to read the interview to get the full picture of this man who ended up competing in the Winter Olympics as the ski slalom participant from Guatemala.

Dick Case

Another unusual interview was with Dick Case, Fred Brooks' deputy at IBM in the 1960s. He and Brooks were responsible for managing the development of the OS/360 operating system which was the workhorse for large IBM computers for over 25 years. Neither he nor Brooks had any software experience before they were given the assignment; they both came from the mainframe hardware side of the IBM Data

Systems Division. But both were good at picking people and managing them. Brooks is noted for stating that adding people to a sick project just makes it worse, not better. Having a few excellent people will get a project done more quickly than trying to smother the project with extra bodies, and that led to the title of Brooks' book, *The Mythical Man-Month*.

Jack London

After our Government Professional Services meeting in Washington, David Grier interviewed Jack London, the CEO of CACI, one of the largest of the government professional services companies, with revenues in the billions of dollars. London told how he was able to grow the company over a 20-year period from a relatively medium-sized competitor to one of the three or four leading companies in that market. Jack was able to train the dozens (later hundreds) of specialists to become outstanding in preparing bids in response to Requests for Proposal from federal agencies and the military, to get the multiyear, multimillion-dollar contracts that were being awarded.

Bruce Coleman

Another unusual interview was with Bruce Coleman who identified himself as a "company doctor." After a few stints as the president or CEO of software companies (Boole & Babbage, Informatics) and of a few troubled companies, Bruce was then repeatedly called in, typically by venture capital investors on the board of directors of a company, to try to resuscitate or to kill sick software companies. Over a 15-year period, Bruce was hired to work as the interim CEO for over 20 companies. His job was to determine whether he could bring the company back to profitability or if it should be sold or terminated. He said that in every case he had to make sure that the original founder or CEO left before he would tackle the assignment. Each project would take about three to nine months to complete. He would then find a new CEO if the company could be saved or else help to sell it or lead it through bankruptcy.

John Imlay

John Imlay was a bigger than life figure in the software products industry and the marketing leader in ADAPSO along with Rick Crandall. John brought Management Systems America back to life after a near-death experience. He built it into the leading accounting software company in terms of revenue through innovative and often outrageous sales meetings, including having a tiger at one of those meetings. He was a promoter and was able to get *Time Magazine* to print the cover of an issue in 1981 with a picture of a computer and the slogan "the Empty Computer" featuring the importance of software to the use of computers. Through the *Time* article, the story about the importance of software products companies was told to business executives. John was one of the initial contributors who funded the SHC. He was the quintessential salesman.

Larry Schoenberg

While professional services often flew under the radar, Larry Schoenberg had started his firm, AGS, Inc., in the mid-1960s and was a leading entrepreneur explaining to the financial community the value of these programming services companies, in contrast to the software products side of the industry. AGS grew from one office in New Jersey into a nationwide company with offices in many major cities. Larry believed in acquiring companies in cities where the headquarters of a strong, large client, often a bank or insurance company, who would provide a consistent stream of business, was located. He also wanted the owner of the acquired company to stay with AGS and continue to lead that office. This meant that over time, Larry built up a strong set of local managers, but retained control of the overall company. AGS's largest client was ATT. He sold the company to NYNEX in 1988 and stayed as its manager for a couple of years. Larry also collected old illuminated manuscripts on scientific and mathematical subjects; he donated his collection to the University of Pennsylvania and partially funded a world-class archive and research center for illuminated manuscripts. Larry was also one of the original founders of the SHC.

COMMUNICATION: THE IEEE ANNALS OF THE HISTORY OF COMPUTING SPECIAL ISSUES

The SI SIG and its predecessor, the SHC, have collaborated with the *IEEE Annals of the History*

of Computing to produce nine special issues devoted to software and services industry topics: The Start of the Software Products Industry; PC Software: Spreadsheets for Everyone; PC Software: Word Processing for Everyone; Mainframe Software: Database Management Systems; Relational Database Management Systems: The Formative Years; Relational Database Management Systems: The Business Explosion; Desktop Publishing: Building the Foundation; Desktop Publishing: Growing the Industry; and Desktop Publishing: Font Technology and Marketing.

In addition, 25 articles and anecdotes have been published in the *Annals* as a result of the solicitation and support of SHC and SI SIG.

PC Software Issues

A few of the special issues stand out in my memory. The twin PC software issues each told a fascinating story of the migration of clients for spreadsheets and word processing software from the original dominant companies through various intermediate companies to the eventual market dominance by Microsoft with Excel and Word. It shows again that being first in the marketplace does not in any way guarantee continued leadership. VisiCalc established the spreadsheet application on the PCs with its ground-breaking concept of real-time updating of the model as each change was made, but that concept could not be protected, only the coding itself. Along came Lotus 1-2-3 which usurped VisiCalc's position and then it in turn gave way to Excel. Similarly, Word Star was by far the leader in word processing on PCs until it was superseded by MultiMate (which copied the Wang word processing system interface) which in turn was displaced by Word.

Relational Database Issues

The two Relational Database issues required getting some talented computer scientists from IBM Research in San Jose to spend their time writing articles about what they had done to make the concepts created by Ted Codd operationally practical and then to get the founders of the principal competitive software companies to write their stories in time to meet the publishing deadlines. It took IBM over ten years before they could announce and deliver a relational database product; by that time there were four new companies that had delivered RDBMS products running on minicomputers so that IBM had an uphill battle except in the mainframe market. The stories in the issues tell why it was so difficult for IBM to exploit its technology in a timely manner and how other companies were far more nimble. One of those companies was Oracle which became one of the largest software companies in the world.

Desktop Publishing Issues

While I owe a debt of gratitude to all of the coguest editors who worked with me so diligently in planning and getting each issue published, I owe a special debt to David Hemmendinger and Dave Walden who enabled the production of the three special issues on Desktop Publishing while I dealt with health issues. The scope and coverage of this topic, resulting from the pioneer meeting (Figure 3), have been the most comprehensive that we have ever done. The issues contain a total of about 20 articles and interviews, including a number from the scientists who were at Xerox PARC and articles about all of the most significant companies in the industry. Desktop publishing and computer-driven printing have revolutionized the entire publishing process and have made it possible for any small company or nonprofit organization to produce printed material of the highest quality and appearance.

Adobe, founded in 1982, has become the dominant player in the DTP market, eclipsing Xerox and Mergenthaler and other large, more established, printer and publishing business companies. The desktop publishing application was also a factor in Apple surviving during the 1980s and 1990s with sales of its Mac computers.

SUMMARY

Other collection techniques were used as the materials collection work of Doug Jerger and the Information Technology Corporate History Project of Luanne Johnson. The archives of both CBI and CHM were used to store and create finding aids for the physical materials.

Collecting history seems to be a never-ending task, but frequently it is an exciting and rewarding adventure. Each meeting was an

Figure 3. Group photograph with all attendees at the Desktop Publishing pioneer meeting in May 2017 at the Computer History Museum. Photograph credit to: ©Douglas Fairbairn Photography.

unusual experience; each oral history was a revealing disclosure of outstanding accomplishments, and each special issue of the *Annals* was a creative joint activity with brilliant people. As Doron Swade stated in a planning paper for the Computer History Museum in 2008, "Computers are the do-everything device; there is literally no application that can't be performed by a computer with enough programming effort." The range of applications is virtually infinite; and to make it even more exciting and challenging, the field keeps growing. The largest companies in the Information Services field in the 2000s did not exist in the 1990s: Google, Facebook, and Amazon, and others that did exist in the 20th century have morphed to become almost unrecognizable: Apple, Microsoft, Intuit, and Oracle. Even an industry icon like IBM has been transformed so that its principal revenue now comes from software and services, not from hardware.

In the past, the physical materials collected have been in paper form. The transition to electronic communication raises the issue of how correspondence and reports from the 1990s on will be preserved because with the switch to electronic preparation and communication of documents, there is often no paper trail and there are many versions of documents without a clear picture of what changes were made. To make matters more difficult, document management in corporations has become an even more sensitive topic with severe legal guidelines about their retention. Corporate storage policies often require that documents and emails be deleted after a certain period of time to avoid future lawsuits. It seems to me that one of the few ways that we will have to preserve the documents of business history will require the collection of those electronic documents or paper copies of them in a contemporaneous fashion. Otherwise, by the time we start to collect 15 years or so later, there will nothing but recollections and no physical or electronic materials to preserve.

We have been able to collect, preserve, and communicate a substantial body of material about the computer software and services industry in the 20th century, and the Software History Website was a principal vehicle. A complete list of all that has been collected is listed at [annals-extras.org/pubs/2020-06-22-lij-sisig-website.pdf] with direct links to the workshops, oral histories, and *Annals* issues.

However, there are still so many untold stories from the 20th century as well as all of the new stories that are waiting to be told. We trust that others will pick up the collecting mantle from Luanne and me and continue to collect and preserve the history of this significant industry. David Brock is the Director of the new SHC at the Computer History Museum and will be leading CHM's efforts to continue the collection, preservation, and communication of the industry's history. I look forward to continuing to work with David in exploring these areas.

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Burt Grad was in the computer software arena since he was with General Electric in the 1950s. He was at GE until 1960, and then at IBM until 1978, becoming a Director of Development after the IBM unbundling of software and services in 1969. As IBM's representative to ADAPSO's software section starting in 1970, he became an active organizer of meetings and special projects. He got to meet and become friends with many of the entrepreneurs who were starting software companies. Leaving IBM in 1978, he started Burton Grad Associates, Inc (BGAI) which was a boutique consulting firm for software and services companies. BGAI served more than 200 clients over the next 28 years. Burt partnered with Luanne to run the Software History Center from 2000 to 2020. Contact him at burtgrad@aol.com.