

DEPARTMENT: THINK PIECE

History of Computing Industry Infrastructure

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In the computing hardware and software industries, those of us who are practitioners and those who are academics or historians usually focus our attention on the companies that produce the principal products or services that are sold to end users. We talk about the hardware manufacturers like IBM, DEC, or Dell and about the software companies like Oracle, salesforce.com, or Intuit. Yet, without the supply chain that provides the hardware components and the software tools on one side, and the distribution infrastructure that also educates buyers on their purchase decisions on the other, our industry would not have become the powerhouse that drove much of the economic growth of the last half of the twentieth century and the first two decades of the twenty-first century. This Think Piece is intended to encourage both practitioners and academics to collect, preserve, research, analyze, and communicate about the infrastructure companies that supply and support the computing industry, and about the people who built these organizations.

Some examples on the supply side include semiconductor and chip manufacturers; tape and disk drive manufacturers; solid state memory companies; research centers (Stanford, Carnegie Mellon, MIT, Xerox PARC, Bell Labs, IBM Research, RAND); Venture Capital firms, investment banks and brokerage firms; merger and acquisition firms; and legal and accounting firms.

Some examples of the distribution-channel infrastructure for computers and peripherals, as well as for software and services, include magazines, newspapers, and professional journals (*Datamation* and *Computerworld*); market research firms (ICP, Gartner Group, and Yankee Group); customer user groups (SHARE and Guide); and retailers, distributors, and marketing organizations.

As one example on the supply side, without a clear means of cashing in on successful companies, venture capital firms would not have taken a flyer on as many

new hardware and software product and services startups as they did. And what made for that vibrant cash-in capability? In the software industry, it was Broadview Associates, led by Bernie Goldstein and Gil Mintz. Almost single handedly, during the 1970s and 1980s, Broadview represented hundreds of computing companies whose owners wished to sell, and a few dozen other companies who were eager to buy them. Located in Ft. Lee, NJ, USA. Broadview built a powerful team of deal makers who brought the buyers and sellers together. Because of Broadview relationships, three software companies alone closed well over 400 transactions: Computer Associates International, Sterling Software, and Platinum Software. Later in the 1980s, other M&A firms entered this lucrative arena, but Broadview continued to be the software merger leader. And in 2005, Broadview itself cashed in by merging with Jefferies & Co.

Another supply-side example is that software products and services presented several new legal and accounting issues. How should a company's investment in developing software be protected and treated? Trade secret and copyright protection were relatively weak safeguards. In the 1970s, software products could not be patented according to the U.S. Patent Office, nor could they be capitalized according to the U.S. Financial Accounting Standards Board (FASB). Milt Wessel, legal counsel for the Association of Data Processing Service Organizations (ADAPSO), and Esther Roditti, the author of the principal reference books on computer law, provided the legal foundation for the use of copyright, trade secret, and eventually patent protection for software. And through the efforts of ADAPSO, led by Larry Schoenberg, the FASB finally recognized software as a financial asset and permitted its capitalization and inclusion on a software company's balance sheet. With these two changes, software companies became substantially more valuable when they went public or were sold.

Now, let us look closely at a couple of examples on the distribution side. As one infrastructure example, consider the market research firms that grew rapidly starting in the 1970s with ICP (Larry Welke), Input

(Peter Cunningham), Gartner Group (Gideon Gartner), and Pat McGovern's various enterprises, including the International Data Group and Computerworld. These companies provided prospective buyers of data-processing systems the comparative analytics they needed to make rational choices about hardware and software purchases. Often this enabled the data-processing departments to make solid economic pitches to company executives who would have to approve the expenditure, in some cases, of millions of dollars.

Another distribution-side example is the companies and retail stores that sold the products (hardware and software) to individuals and small-to-medium-sized businesses. The so-called original equipment manufacturers and value-added resellers took the mini-, mid-range, and microcomputers and packaged them with the necessary peripherals and application software they needed to make them useful to manufacturers, retailers, and insurance agencies. Each of the myriad user industries ended up having a few of these types of firms provide a complete package that they would install and service. For individuals who wanted to use VisiCalc, WordStar, or Lotus or their successors, this sales and support role was originally played by Computerland and then by Best Buy and Staples and Office Depot, who turned out to be the final survivors in what was a brutal retail battle (and even they have now been partially replaced by Amazon, Apple, and Dell with direct-to-user sales).

Even with just these examples in mind, collecting and interpreting the infrastructural aspect of what is

now one of the world's largest industries is itself a mammoth challenge.

- › *To those working in computing infrastructure:* Start preserving and collecting the stories and materials (documents and ephemera) from the companies that are providing these vital elements. Tell the stories that are unique to your segment of the infrastructure.
- › *To computing historians and academics:* Consider the opportunity to plow new ground. You have the chance to create new insight and provide the framework for aspects of the computing industry that are virtually untapped.

BURT GRAD has been in the computer software arena since he worked on the Univac I at General Electric in the 1950s. He was at GE until 1960, and then at IBM until 1978, becoming a Director of Development after being part of the IBM unbundling team for 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 became 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 Johnson to start and run the Software Industry SIG at the Computer History Museum from 2000 to 2022. Contact him at burtgrad@aol.com.