

Biographies

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ADAPSO, time-sharing firms, and software companies: 1968–1975

ADAPSO, The Association of Data Processing Service Organizations, was established in 1961 as a trade group for the burgeoning service bureau industry (see Figure 1). It emerged as a venue for informal interactions and formal collaborations between firms using computers and punched card machines to provide administrative services. Its early development was explored recently in *Annals* in an article and series of four biographies.¹ This article explores ADAPSO's continued development during the late 1960s and 1970s as it broadened its scope to include firms providing other kinds of computer-related services.

ADAPSO in the late 1960s

In mid-1968, ADAPSO had a total of 377 members, 204 of which were full voting members. The vast majority of these were service bureaus providing some kind of administrative data processing services to businesses. The association was growing rapidly. At the beginning of that year, *ADAPSO News* had informed the association's membership that its new headquarters had been established on Lexington Avenue in New York City, shifting away from the home office of the association's retiring founder William H. Evans in Abington, Pennsylvania. This coincided with the announcement that a young man named Jerome L. Dreyer had taken over as executive vice president of the association.² The new office was by no means large, with Dreyer's initial staff consisting of one part-time secretary.



Figure 1. ADAPSO logo, as used during the late 1970s and 1980s. (Courtesy of Charles Babbage Inst., Univ. of Minnesota, Minneapolis.)

Dreyer was to run ADAPSO for almost two decades, until 1986. Association management was his whole career. Dreyer had an undergraduate degree in journalism from New York University. After graduation he had served an apprenticeship in business association administration at the American Management Association, the National Association of Mutual Savings Banks in New York City, and the Farm and Industrial Equipment Institute in Chicago. He knew almost nothing about computers, but had considerable experience in organizing meetings, writing press releases, and providing services to members.³

Like many long-serving executive directors, Dreyer exerted considerable influence over the policies adopted by his association. While associations generally leave policy formation in the hands of an elected board and its officers, these positions are part time, and their occupants are usually required to rotate after one or two years. Executive directors, however, control the daily functioning of the association and can outlast many generations of elected leaders. Dreyer came to hold considerable power over the nomination of the ADAPSO presidents and other officers. He remembers "looking over the group of people that we had with us as members" and saying, "He's got to be president some day ... and he's got to be chairman later on, and that guy over there is going to head up my education committee."⁴

The most fundamental challenge facing ADAPSO during the late 1960s and early 1970s was the assimilation of new kinds of computer services and software businesses alongside its original constituency of service bureaus. By 1967, a few time-sharing and software firms had begun to join ADAPSO. (The software firms were, at this point, likely to be firms specializing in contract programming services.⁵) While software and time-sharing firms were distinct from service bureaus, they appeared to have sufficient overlap to justify an alliance. Service bureaus had long viewed programming services as a desirable, high-margin service with which to supplement the sale of machine time.

The association was forced to accommodate some fundamental differences between the priorities of these new members and those of its existing core. From the mid-1960s onward, ADAPSO prepared statistical surveys on topics of interest to its members. One important series was the Operating Ratios Survey, based on financial data collected from a sample of member firms. The 1967 survey discovered that service bureaus, time-sharing firms, and software companies had quite different business

models. Service bureaus typically had lower revenues than software firms (\$450,000 versus \$1.6 million) but more fixed assets. They reported obtaining just 13 percent of their revenue from “program and systems”, suggesting that most remained heavily focused on simple processing services.

The time-sharing firms of 1967 were in a similar financial position to the dot-com firms of 1999, losing an average of \$275,000 on revenues of \$500,000.⁶ An early presentation to an ADAPSO meeting by a representative of Tymshare, Inc. laid out the firm’s operations and business model, concluding with the observation: “Many people wonder how you can make a time-sharing operation profitable with rates that appear to be that low. Well, we wonder about that too!”⁷

Time-sharing firms in ADAPSO

Despite this gloomy financial picture, many saw time-sharing as the future of the industry. As early as 1965, a representative of Univac had assured an ADAPSO meeting that it “will soon grow to be the most important area in the field.”⁸ As Martin Campbell-Kelly has shown, the speculative boom that visited the newly christened software industry in the late 1960s was centered on time-sharing firms. Many leading service companies lost many millions of dollars in attempting to enter the computer utility business, acquiring traditional service bureaus along the way.⁹

In 1967, the ADAPSO board established a committee “to study the possible benefits of cooperative effort in the utilization of time-sharing concepts.”¹⁰ In some ways, it made sense to view time-sharing as an extension of the service bureau business. Previously, the need for easy exchange of computer tapes, printouts, and punched cards kept service bureaus close to their customers and limited the economies of scale available to large national firms. The widely promoted computer utility concept was just another way of providing data processing services. Customers would connect via telephone lines and dedicated computer networks, rather than sending their data by courier or postal service.

In practice, the culture and concerns of the time-sharing firms that survived the industry shakeout at the end of the 1960s were quite different from those of most service bureaus. Success in time-sharing required a much larger capital investment, the creation of complex systems software, and a highly skilled programming team. As they were developing and proving new technologies for operating sys-

tems and data communications, they were often much more technological in their management focus than the traditional service bureau organizations. According to a Tymshare representative,

Unlike batch processing computer centers, which are noted for mass confusion, when the computer is running, a timesharing center is a very quiet place. It only requires one operator to watch the lights flicker. ... After a crash, the time sharing center is a wild place. The phones are ringing off the hooks and computer operations and services personnel are coming out of the woodwork with sneakers on to try to get the system back up.¹¹

Few sneaker wearers were likely to hide in the woodwork of a traditional service bureau. In contrast, and as the career of Comshare cofounder Rick Crandall shows, commercial time-sharing pioneers would benefit from systems programming experience and graduate degrees in computer science.¹²

In 1968, Thomas J. O’Rourke of Tymshare was already an ADAPSO board member, but time-sharing firms had otherwise maintained a rather low profile within the association. Comshare CEO Robert Guise was invited to attend an ADAPSO board meeting to discuss the representation of time-sharing firms. He reported that members of the time-sharing industry were holding regular, though apparently informal, meetings and that moves were afoot to establish a computer time-sharing services association. The ADAPSO board resolved to work more closely with this group and attempt to persuade its members that their concerns would be best addressed from within the association.¹³ Early in 1969, the board approved O’Rourke’s suggestion that the time-sharing group be admitted to ADAPSO, to create the association’s first formal section—the Computer Timesharing Services Section.¹⁴

Specialist time-sharing firms such as Tymshare, Comshare, General Electric Information Services Division, National CSS, and several short-lived rivals were heavily involved in this section.¹⁵ Computer vendors such as Univac, Xerox, Control Data, Honeywell, and IBM were also involved, though not necessarily all at the same time.

Unlike the first generation of ADAPSO firms, the time-sharing companies shared an immediate and pressing political concern. Years before the break up of AT&T or the beginning of serious telecommunications deregulation, they were operating in a legally hazardous area

somewhere between the largely unregulated (if sometimes monopolistic) world of the computer industry and the tightly regulated and legally enforced telecommunications monopoly of the Bell system.

While the idea of convergence between the two industries was already fashionable during the 1960s, it was far from clear which culture or legal framework was likely to prevail. Thus, as well as keeping regulated telecommunications firms out of the market for general-purpose data processing services, the time-sharing firms had to fight efforts by traditional telecommunications carriers to expand the existing regulatory regime to encompass all firms offering public services over telephone lines. Rick Crandall recalls that Comshare was able to share a single long-distance line from the firm's data center between several locally connecting modems only after building its own "store and forward device." Using a standard multiplexer to do the job was viewed as an illegal resale of a telecommunications capacity, whereas copying incoming bits into a tiny buffer before retransmitting them turned the device into a computer and therefore made it legal to connect.¹⁶

It's no surprise, therefore, that the new Computer Timesharing Services Section made representation of the fledgling industry to Washington, D.C. one of its top priorities, or that the leaders of these companies viewed participation in ADAPSO as a productive use of their time. As early as 1967, the ADAPSO Annual Meeting of Members adopted a resolution that

organizations affiliated with common communications carriers shall not be permitted to market electronic data processing services commercially except at prices and/or terms which do not have the effect of injuring competition ...¹⁷

The section pursued this fight throughout the 1970s and 1980s, into what proved an era of radical telecommunications deregulation. The most important battleground was a series of consultative and policy-setting proceedings carried out by the Federal Communications Commission, known as the First, Second, and Third Computer Inquiries.¹⁸ The section was small, and the deep concern with these issues held by its members was not shared by the rest of the association. This sometimes caused friction, but members of the section recalled that their firms were much larger than the software and service bureau companies that made up the rest of ADAPSO, and so paid association dues at a much higher level (in addition to a special section membership fee to support its efforts).¹⁹

In 1974, the Computer Timesharing Section was renamed the Remote Processing Services Section. Remote processing was a broader concept than time-sharing. It included so-called remote batch processing, where a user uploaded a program and data, and might later download the results, but did not stay online to run the program itself interactively. It also included a range of online services. *ADAPSO Newsletter* announced that

the major reason for the name change is to make the Section's activities more indicative of its true direction, thus making it more palatable to non-members who may have felt that they did not fit under the previous concept implied in the name.²⁰

Accompanying this was a substantial reduction in the additional dues required of section members.²⁰ This push for breadth seemed to be working, because by early 1974 the section reported 20 members, up from a low of eight at the end of 1972.²¹

The increasing importance of teleprocessing firms was reflected within ADAPSO as a whole. In 1973, Thomas J. O'Rourke of Tymshare, one of the leading time-sharing firms, was elected president. He was followed in 1978 by Richard L. Crandall of Comshare, and in 1981 by Robert Weissman of National CSS (by then a division of Dun & Bradstreet).

Software firms and the reorganization of ADAPSO

Another important development for ADAPSO was its emergence as the main trade association for suppliers of packaged software. Until the late 1960s, there had been no real market for programs as freestanding standard products. But by the late 1960s, a handful of companies had begun to specialize in the selling of standard software packages for mainframe computers. Historians agree that IBM's 1969 decision to begin charging separately for most of its software offerings, rather than bundle them with hardware purchases, was a key development in encouraging the development of the software industry. The most successful early products were specialized pieces of system software, such as file management systems, source code library managers, and automatic flowcharting systems. These were used primarily within data processing departments to improve programmer productivity.²²

ADAPSO moved relatively rapidly to open its doors to this new breed of software product companies, amending its bylaws in 1968. However, it was not until its 1972 merger with the Association of Independent Software

Companies—a process orchestrated by Larry Welke of specialist publishing firm ICP—that it became an important forum for these firms.²³ These firms remained a distinct section within ADAPSO, with a culture and set of concerns largely distinct from those of the service bureaus or time-sharing firms.

The legal status of software was in many ways undefined during the early 1970s, which was a matter of obvious interest to firms trying to support themselves by selling it. Packaged software occupied a rather nebulous position somewhere between traditional goods and services. Software products initially seemed to have a considerable amount in common with the professional service firms, for whom contract programming was generally a primary business. By the mid-1970s, however, it was apparent that, as Welke puts it, “product has a totally different cost set-up, different revenue streams, different equations on how you run the business from professional services.”²⁴ ADAPSO’s most important function for the software product companies was to provide a forum in which they could collectively work out exactly what parameters to plug into these equations.

One particularly controversial topic was the patentability of software inventions and algorithms, a topic recently explored within *Annals* by Marty Goetz of Applied Data Research, an active ADAPSO member who played an important role in establishing legal precedents in the area.²⁵ Even within ADAPSO, this remained controversial. Lee Keet, another active former member of the Software Industry Section, continues to feel that “even though there are thousands and thousands, tens of thousands of patents for software, I still think they are all invalid.”²⁶ Even the applicability of copyright to computer code was unclear, prior to the passage of the 1976 Copyright Act. One of legal counsel Milton Wessel’s first interactions with ADAPSO involved examining legal opinions on the matter.²⁷

By the end of the 1970s a clear pattern for mainframe software sales had been constructed. While easy to take for granted in retrospect, it was far from obvious at the time. Software was generally sold directly, by full-time salesmen employed by the company concerned. Software code was protected by copyright, and specific innovations could also (in some cases at least) be patented. Software was legally leased rather than purchased, so that the uses made of it by the purchaser could be regulated. Virtually all packages required a large initial payment, followed by an annual maintenance fee in return for which the customer would receive technical support and updates. Users of

systems products did not usually have access to source code and could not perform their own modifications to the core program. Most firms distinguished between major new versions of the software and minor bug fixes and patches. The former appeared every year or two and generally carried an additional charge. The latter appeared in a steady trickle and were covered by the initial fee and maintenance payments. New functions of interest to only some customers, such as an interface to work with a particular operating system, were frequently sold as optional add-on modules for a considerable extra fee.

Another question of direct interest to members of the section was whether software should be considered a good or a service. ADAPSO staff lawyer Ron Palenski recalls contradictory claims in this area:

On one hand, the Federal government took the position that software was intangible and, therefore, did not qualify for things like accelerated depreciation, the investment tax credit, and other favorable tax treatment. But the states, in their desire for revenue, were taking the position that software was tangible, and therefore, its transfer or sale was subject to sales and use taxation.²⁸

ADAPSO was particularly active in supporting its member firms against attempts from state governments to define software as taxable property. This threat was reported as early as 1972, and by 1973 California, Kansas, Michigan, and Washington had all attempted to tax software with numerous other states expected to follow suit.²⁹ An important victory came in 1977, when the New York State Tax Commission ruled that computer software was not taxable under its existing regulations.³⁰ These legal efforts required a special 15 percent dues surcharge in 1976.³¹ The association remained active in monitoring and fighting such proposals well into the 1980s.

Software firms faced a similar, though conceptually almost inverse, challenge from the Federal Accounting Standards Board. Packaged software companies viewed their proprietary source code as an important asset. They wanted to be able to report its value as an asset on the balance sheet and defer portions of development expense over several years to reflect the cyclical nature of software product revenues and development efforts. This was another area where the intellectual issue at stake was really the choice of metaphor: Was investment in a new package more like building a factory (where costs in one year could be used to reduce taxable

profits later once the factory was up and running), or was it more like a high-risk research project where future returns were impossible to gauge? Neither metaphor fit all software development, and the lack of precedents gave software firms a sense that concerned collective action offered them a good chance of influencing the final accounting consensus.³²

ADAPSO and its members

For much of the 1960s, ADAPSO had published a simple newsletter. In 1969, the association jumped into the world of glossy magazines with its official journal, *Computer Services* (see Figure 2). Well illustrated and featuring substantial articles, this hefty publication was produced in collaboration with Hal Spector of the Technology Publishing Corporation. The plan was that its print run of about 12,000 could be distributed to potential users of computer services, with the cost covered by advertising sales. Dwindling advertising sales during a recession caused Technology Publishing to drop the journal in early 1971, leading to some acrimony and a threat of legal action. With the failure of *Computer Services*, ADAPSO reverted to a rather homemade-looking newsletter format for the *ADAPSO Newsletter*.³³

A 1972 reorganization remade ADAPSO's formal structure as a federation of the various sections. Although the software and time-sharing sections were becoming increasingly important to the association, service bureaus (or, as they increasingly called themselves, data processing centers) remained the core of the association's membership and controlled most of the seats on its board. The reorganization created a third interest group, the Data Center Section, for the service bureaus. All ADAPSO member firms were required to join one or another of the three sections. Ten of the 15 seats on the ADAPSO board were divided almost equally between the sections, with the most senior officers within each section automatically becoming members of the ADAPSO board. Funds not required by headquarters were passed on to the sections according to the proportion of the association's total income provided by their members.³⁴ With this shift, sections moved from the periphery of the association to its heart. Although further shifts were made to tweak this system, including some redistribution of power away from the sections, this basic framework stayed in force into the 1980s.

The sectional structure segmented members according to the kind of business they were involved in. This was an alternative to another form of organization considered: the establish-



Figure 2. Advertisement for the short-lived ADAPSO journal, *Computer Services*. (Courtesy of Charles Babbage Inst., Univ. of Minnesota, Minneapolis.)

ment of local chapters. The idea of chapters was first broached around the time of the association's founding, and a Chicago chapter was almost recognized in 1962.³⁵ The idea resurfaced periodically. Dreyer took some credit for killing the idea of local sections, saying that he thought it would be divisive, and that they would "fight for money and program time" with the national organization. "Took me about a year to get rid of them," he recalled.³

As the staff grew, membership growth (see Figure 3, next page)³⁶ became the responsibility of the director of public relations, Dave Sturtevant. Recruitment techniques included regional breakfast meetings, personalized invitations to nonmembers, and free guest attendance at conferences.

In 1974, after several years of discussion, the association's headquarters moved again, out of the expensive environs of midtown New York and over the river to Montvale in New Jersey. The move was motivated, at least in

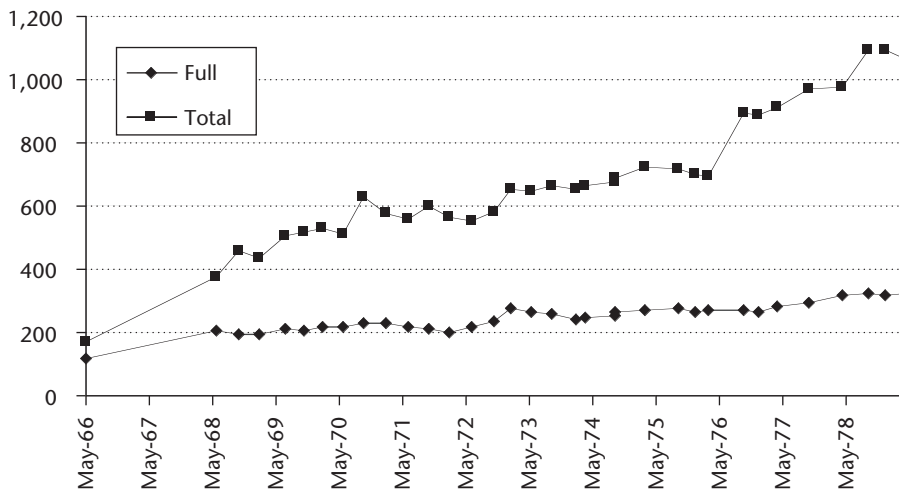


Figure 3. Changes in ADAPSO membership from 1966 to 1979.

part, by Dreyer's desire to work closer to his home. By this point he recalls that the association's staff had grown to about six, including Tom Farewell who served as Dreyer's primary assistant, with the formal title of director of member programming.³⁷ Another staff member, Olga Grkavac, was responsible for government relations. The increase in staff permitted a gradual expansion in the association's formal services and programs, especially in the political area. On 13 November 1978, a new ADAPSO headquarters was officially opened in Washington, D.C. This accompanied a shift of staff and resources within the association toward political and legal activities.³⁸

Because of space constraints the final portion of this analysis, dealing with ADAPSO's legal action on topics of collective interest to its members, and the association's development during the 1980s, will be published in the next issue of *Annals*. It will be accompanied by a biography of Larry Schoenberg, one of the association's most active members during the late 1970s and 1980s.

Acknowledgments

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References and notes

1. T. Haigh, "ADAPSO and the Service Bureau Industry, 1961-1968," *IEEE Annals of the History of Computing*, vol. 26, no. 1, 2004, pp. 75-85. The biographies are T. Haigh, "Biography: Bernard (Bernie) Goldstein," *IEEE Annals*, vol. 26, no. 1, 2004, pp. 85-90; T. Haigh, "Biography: Larry A. Welke," *IEEE Annals*, vol. 26, no. 4, 2004, pp. 85-91; T. Haigh, "Biography: Richard L. (Rick) Crandall," *IEEE Annals*, vol. 26, no. 4, 2004, pp. 79-85; and T. Haigh, "Biography: Frank Lautenberg," *IEEE Annals*, vol. 26, no. 1, 2004, pp. 90-93.
2. Dreyer had previously served briefly as an assistant in the Abington office, and then as an assistant to the association's 1967 president Frank Lautenberg in ADP's headquarters in New Jersey. Dreyer recalls his first appointment as beginning on 10 Dec. 1966, and surviving board minutes record his confirmation as an assistant to Lautenberg taking place on 10 July 1967. This information is taken from an oral history interview conducted with Jerome L. Dreyer on 1 May 2004 by T. Haigh. A transcript of this interview will be donated to the Charles Babbage Institute (CBI), but as yet formal citation and pagination information are not available.
3. J.L. Dreyer, oral history interview by T. Haigh, 1 May 2004.
4. *Ibid.* While the formal records of the association give little insight into the selection of nominees, Dreyer's claim fits with the informal recollection of other ADAPSO participants that he exercised considerable backroom power in this area.
5. On the meaning of *software* in the 1960s, see T. Haigh, "Software in the 1960s as Concept, Service, and Product," *IEEE Annals*, vol. 24, no. 1, 2002, pp. 5-13.
6. ADAPSO, "Second Operating Ratios Survey," 1967, ADAPSO Records (CBI 172), Charles Babbage Inst. (CBI), Univ. of Minnesota, Minneapolis.
7. J.K. Jerrehian, "The Computer Time Sharing Business," *ADAPSO News* (CBI 172), vol. 8, no. 2, 1968, pp. 3-5.
8. J.A. Buckland, "Real Time Data Processing," *ADAPSO News* (CBI 172), vol. 5, no. 3, 1965, pp. 4-9.
9. M. Campbell-Kelly, *From Airline Reservations to Sonic the Hedgehog: A History of the Software Industry*, MIT Press, 2003, pp. 80-86.

10. ADAPSO, "Board Meeting Minutes, Fairmount Hotel, San Francisco," 18–20 Oct. 1967, p. 5, CBI 172, CBI.
11. J.K. Jerrehian, "The Computer Time Sharing Business," *ADAPSO News* (CBI 172), vol. 8, no. 2, 1968, pp. 3-5.
12. Crandall gave his own account of the founding of Comshare in R. L. Crandall, "Recollections of the Beginning of the Time-Sharing Industry," *IEEE Annals*, vol. 24, no. 4, 2002, pp. 40-42.
13. ADAPSO, "Board of Directors' Meeting Minutes," 24 Oct. 1968, CBI 172, CBI.
14. ADAPSO, "Board of Directors' Meeting Minutes," 12 Feb. 1969, CBI 172, CBI.
15. An early list of members is given in "CTSS," *ADAPSO Newsletter* (CBI 172), vol. 1, Oct. 1971, pp. 1.
16. R.L. Crandall, oral history interview by P. Ceruzzi, 3 May 2002, CBI, p. 8.
17. "Report on June 15 Conference," *ADAPSO News* (CBI 172), Sept. 1967, pp. 11-12.
18. A concise history of the regulatory issues around data communications during this era is given in G.W. Brock, *The Second Information Revolution*, Harvard Univ. Press, 2003, pp. 170-185.
19. L. Johnson, ed., "Telecommunications Issues Workshop," *ADAPSO Reunion Transcript, May 2–4, 2002*, iBusiness Press, 2003, pp. 123-149.
20. "ADAPSO Officers and Directors," *ADAPSO Newsletter*, vol. 3, Nov.–Dec. 1973, pp. 2-4.
21. ADAPSO, "Board Meeting" (minutes), 20 Feb. 1974, CBI 172, CBI.
22. See reference 9 for the history of the software industry. On IBM's unbundling, see B. Grad, "A Personal Recollection: IBM's Unbundling of Software and Services," *IEEE Annals*, vol. 24, no. 1, 2002, pp. 64-71 and W.S. Humphreys, "Software Unbundling: A Personal Perspective," *IEEE Annals*, vol. 24, no. 1, 2002, pp. 59-63.
23. The formation of the ADAPSO Software Industry Association Section was explored in T. Haigh, "Biography: Larry A. Welke," *IEEE Annals*, vol. 26, no. 4, 2004, pp. 85-91.
24. L. Welke, oral history interview by T. Haigh, 3 May 2002, OH 369, CBI, p. 6.
25. M. Goetz, "Memories of a Software Pioneer: Part I," *IEEE Annals*, vol. 24, no. 1, 2002, pp. 43-56.
26. L. Keet, oral history interview by P.L. Frana, 3 May 2002, OH 341, CBI, p.12. See also the discussion in L. Johnson, ed., "Intellectual Property Issues Workshop," *ADAPSO Reunion Transcript, May 2–4, 2002*, pp. 151-174.
27. Wessel communicated his findings to the ADAPSO membership in M.R. Wessel, "Legal Protection of Computer Programs," *ADAPSO News*, vol. 5, no. 1, 1965, (CBI 172), CBI.
28. L. Johnson, ed., "Intellectual Property Issues Workshop," *ADAPSO Reunion Transcript, May 2-4, 2002*, pp. 151-174, 164.
29. "California Legislature Passes Software Exemption," *ADAPSO Newsletter* (CBI 172), vol. 2, May–June 1972, p. 3. "Computer Software-Continuous Target for Tax Collectors," *ADAPSO Newsletter* (CBI 172), vol. 3, Mar.–Apr. 1972, p. 1.
30. "ADAPSO Annual Report," 1978–1979.
31. ADAPSO, "Board of Directors Meeting" (minutes), 18 Nov. 1976.
32. One example of the Association's lobbying in this area is the 1976 position paper "Financial Accounting Standards Board Statement Number Two and Subsequent Interpretation Number Six," a copy of which is preserved in the bound volume "ADAPSO Position Papers," CBI 172, CBI.
33. Copies of most issues of *Computer Services*, related correspondence, and drafts of many of the articles published in it are included in the as-yet-uncataloged portions of CBI 172.
34. "ADAPSO Reorganization," *ADAPSO News* (CBI 172), vol. 2, Jul.–Aug. 1972, pp. 2-3.
35. ADAPSO, "Minutes of the Council," 27 Feb. 1961, CBI 172, and "Chicago Chapter—National Meeting" (minutes), 14 May 1962, CBI 172, CBI.
36. This chart is based on membership totals appearing in ADAPSO board minutes during the period, found in CBI 172. Full members were those firms satisfying all requirements for membership in ADAPSO. These requirements changed over the time period. The "Total" figures include two main additional kinds of members. Most of them were branch offices of larger data processing services firms, such as ADP. There was also a much smaller number of associate member firms, which did not qualify for full membership but had an interest of some kind in computer services. The different membership classes were discussed in T. Haigh, "ADAPSO and the Service Bureau Industry, 1961–1968," *IEEE Annals*, vol. 26, no. 1, 2004, pp. 75-85.
37. "New Staff Appointment," *ADAPSO Newsletter*, vol. 4, Jul.–Aug. 1974, pp. 1-2.
38. The idea of moving to Washington, D.C., had been discussed for several years and was debated prior to the 1972 move from New York to New Jersey. Wessel was opposed, worrying about costs and staffing issues and feeling that government officials might actually take out-of-town visitors more seriously as business representatives. See M.R. Wessel, "Letter to Jerome L. Dreyer, August 11, 1977," Milton R. Wessel Papers (CBI 120), CBI.

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