

Chapter 7

**Electronic Databases and
Dissemination of Government
Information**

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Electronic Databases and Dissemination of Government Information

SUMMARY

The importance of the public information functions of the Federal Government has been recognized since the founding of the Republic. Congress has taken a long series of actions to institutionalize these functions, by establishing, for example, the national libraries (of Congress, Medicine, and Agriculture), Government Printing Office, Federal Depository Library Program, and National Technical Information Service, and enacting laws such as the Public Printing Act, Freedom of Information Act, Federal Program Information Act, and Government in the Sunshine Act.

Public information, that portion of government information that is not personal, proprietary, or classified (or otherwise subject to Freedom of Information Act (FOIA) exemptions), is vital to the missions of virtually every department and agency of government, and runs the gamut from reports, periodicals, directories, and handbooks; to rules, regulations, and circulars; to scientific and technical information, statistical data, satellite imagery, and computer models; to maps, charts, and photographs.

However, new public information issues are being raised (and old ones exacerbated) by the confluence of several key trends: the continuing importance of public information; the reduction of paperwork and publications (in part due to requirements of the Paperwork Reduction Act (PRA) and Deficit Reduction Act); the growing role of the private sector (which depends heavily on the use of modern information technology); and the increasing Federal agency use of electronic collection, maintenance, and dissemination of public information.

Use of information technology—such as electronic document filing, computer-aided surveys, computerized databases, optical disks, electronic mail, electronic remote printing, and electronic bulletin boards—could revolutionize the public information functions of government. There are already numerous Federal agency pilot projects, and some of the more visible ones have generated intense controversy. Once again, the issues are complicated because of inherent tensions involving public access and the public's right to know, the role of Federal agencies in actively disseminating public information, management efficiency and cost reduction, private sector cooperation and competition, and, particularly for scientific and technical information, national security and foreign trade concerns.

OTA concluded that further research in this area is warranted, but that, ultimately, Congress is likely to be called on to update existing public information laws and address a variety of issues, such as:

- the cost-effectiveness of electronic information options;
- the equity of access to electronic government information;
- the private sector role in Federal electronic information activities;
- the institutional responsibility for policy and operations concerning government information collection and dissemination;
- the need for a public information index or clearinghouse;
- mechanisms for exchange of learning from innovative electronic information activities;
- use of information technology in Freedom of Information Act implementation;

- electronic recordkeeping and archiving;
- scientific and technical information exchange; and
- other issues—transborder information flow, depository library system, Federal statistical system, and copyright protection.

OTA also reviewed innovative activities in selected States (Michigan, Virginia, Oregon, North Carolina, California, and Florida) and localities (Lane County, Oregon; Columbus, Ohio; and Beverly Hills, Irvine, Pales Verdes, and Buena Park, California). The results, combined with those from OTA's Federal Agency Data Request, indicate that information technology can facilitate public access to government information. Two applications appear to have noteworthy potential:

1. electronic access to information about the process and results of government activities, especially decisionmaking activities; and
2. access (electronic where feasible) to the databases and computer models used by government agencies to develop and evaluate options and formulate positions on various issues. (See ch. 6 for related discussion.)

This potential depends in good part on an interested and educated citizenry, as well as on the absence of technical and cost barriers. Nonetheless, information technology appears to offer significant potential to implement public access to, as well as dissemination of, government information.

INTRODUCTION

Information technology holds out the promise of faster, cheaper, and more efficient collection (e.g., through computer-aided surveys or document filings), storage (e.g., in computerized databases, optical disks), and dissemination of government information (e.g., via electronic mail, interactive data networks, electronic bulletin boards, remote printing-on-demand, and computer tape exchange). OTA's preliminary research in this area suggests that the Federal Government is at or near the threshold of a major transition toward greater use of information technology for managing government information.

At the same time, because government information is vital to so many users—in and outside of government—and central to numerous public laws and agency missions, this tran-

sition is being closely watched and is raising a wide range of issues. Indeed, several pilot projects have become highly controversial. This is in large part because the policy framework for agency applications (e.g., electronic filing, database creation, and remote printing) is *not* clear.

OTA concluded that the technological possibilities, institutional alternatives, and policy options deserve further research attention, but that, ultimately, Congress is likely to be called on to update existing public laws—or enact new ones—for this emerging Federal electronic information environment.

The results of OTA's preliminary research on this topic are presented below, including a discussion of key trends and issues.

KEY TRENDS

Continuing Importance of Government Information

The transition of the Federal Government from paper-based to greater electronic collection, maintenance, and dissemination of infor-

mation is controversial because of the importance placed on government information itself.

For purposes of this analysis, OTA defined "government information" as information collected and/or developed at Federal Govern-

ment expense (i.e., with public funds) to carry out government functions and agency missions (whether or not the information itself is explicitly authorized or required by statute). Government information includes everything that is legally available to the public, as well as those specific types of information restricted from public access under the Freedom of Information Act exemptions (e.g., law enforcement, investigative, confidential, proprietary, and classified information). In this preliminary research, OTA focused primarily on government information that is publicly available, i.e., "public" information. Such information runs the gamut from statistical data, computer models, reports, periodicals, directories, and handbooks; to rules, regulations, and circulars; to maps, charts, and photographs.¹

The importance of the public information functions of the Federal Government has been recognized since the founding of the Republic. Congress has taken a long series of actions to institutionalize these functions, as illustrated by the establishment of the Library of Congress in 1800, Library of the Surgeon General's Office in 1836 (later to become the National Library of Medicine), Government Printing Office (GPO) in 1860, National Agricultural Library in 1862, Federal Depository Library Program in 1913, and National Technical Information Service in 1970.²

In addition, Congress has articulated the importance of access to and dissemination of public information in enacting, for example, the Freedom of Information Act in 1966, Public Law 91-345 establishing the National Commission on Libraries and Information Science in 1970, the Federal Program Information Act (concerning information about Federal assistance programs), and the Government in the Sunshine Act in 1976.³

¹For a complete discussion of definitions and types of government information, see Charles R. McClure and Peter Heron, *Federal Government Provision of Public Information: Issues Related to Public Access, Technology, and Laws/Regulations*, OTA contractor report, Dec. 28, 1984.

²See *Ibid.*; and Marilyn Gell Mason, *The Federal Role in Library and Information Services* (White Plains, NY: Knowledge Industry Publications, 1983).

³*Ibid.*

Congress has enacted numerous public laws assigning public information functions to specific Federal agencies. According to the Congressional Research Service, Congress enacted a total of 92 laws during the last four Congresses (95th through 98th) on government information systems, clearinghouses, and dissemination. In the 98th Congress alone these laws spanned the information spectrum from alcohol and drug abuse, education of the handicapped, smoking health hazards, and adult and vocational education to arctic research, water resources, and hazardous waste control.⁴ As further illustration, 28 bills on public information topics had been introduced in just the first 6 months of the 99th Congress, that, if enacted, would establish the following kinds of government information activities (some bills proposed more than one kind of activity):⁵

- provide information on request (9 bills),
- establish information clearinghouse (8),
- collect information (8),
- disseminate information (7),
- establish national database or directory (5), and
- establish uniform information reporting procedures (5).

Reduction of Paperwork and Publications

Congress has also expressed the desire to reduce the paperwork burden of the Federal Government and redundancy or inefficiency in government data collection efforts, as reflected in enactment of PRA in 1980. In addition, the Office of Management and Budget (OMB) has led a strong effort to reduce the cost of government public information activities, in part on its own initiative and in part

⁴Sandra N. Milevski and Robert L. Chartrand, "Information Policy: Legislation of the 95-98th Congresses, With Selected Bills of the 99th Congress," Congressional Research Service, Library of Congress, June 1985.

⁵Sandra N. Milevski, CRS, June 1985.

⁶See, for example, Office of Management and Budget, "Elimination of Wasteful Spending on Government Periodicals, Pamphlets, and Audiovisual Products," Bulletin No. 81-16, Apr. 21, 1981; and Office of Management and Budget, "Elimination and Consolidation of Government Periodicals and Recurring Pamphlets," Bulletin No. 81-16, Supplement No. 1, Oct. 9, 1981.

in response to the Paperwork Reduction Act of 1980 (with respect to information collection activities) and the Deficit Reduction Act of 1984 (with respect to publishing, public affairs, and audiovisual activities).

OMB claims that 3,848 of the approximately 10,000 publications in the Federal inventory have been eliminated or consolidated and another 3,100 have been cut back.⁷

With respect to paperwork reduction, OMB has given priority to reducing the paperwork burden (specific annual reduction goals were included in the act) defined in terms of the "information collection budget," that is, the number of hours estimated to fill out government forms. OMB claims a net reduction of 36 percent in the paperwork burden between 1980 and 1984.⁸

In combination with the Administration's program to reduce fraud, waste, and abuse, OMB worked to eliminate or consolidate 3,848 government publications (as noted above) and close or downgrade 111 government printing plants. In response to the Deficit Reduction Act of 1984, OMB is proposing further reductions in publishing and audiovisual activities and in public affairs activities. However, the amount of the reductions is less than that suggested by the act, because, according to OMB, any further reductions would compromise essential agency missions.⁹

To provide further confirmation of reported reductions, OTA asked agencies to provide (to the extent available) budget, staffing, and activity data for printing and publishing in fis-

cal years 1980 and 1984 (actual by year), 1985 (projected), and 1986 (anticipated). The completeness of the responses varied widely, but many agencies did indicate a reduction in staff, and frequently in budget as well, for printing and publishing, along with a reduction in the number of titles and copies prepared.¹⁰

These developments have, to some extent, given more impetus to examining electronic alternatives to paper-based public information systems, on the premise that electronic alternatives will be less costly and more effective.

Growing Role of the Private Sector

The role of information technology (e.g., computers, telecommunications, and electronic printing) in the larger sense has been as a catalyst of change. The technology has vastly expanded the options for the collection, maintenance, and dissemination of all kinds of information, including public information, and has helped spawn a new industry—the "information industry." This industry depends heavily on the use of modern information technology and is aggressively seeking opportunities to serve all markets—including the public information market. Thus, there are now numerous private companies that seek to provide public information products or services, either under contract to the government, in competition with the government, and/or as a complement to the government by adding value to or repackaging government information.

The Information Industry Association (11A), a trade association representing information publishers and providers of all varieties, claims that U.S. information companies had revenues in 1983 of \$13 billion, growing at 20 percent per year. The 11A has over 450 members, including firms like Chase Econometrics, Dun & Bradstreet, University Microfilms, McGraw-Hill, Dow Jones, and Congressional Information Service.¹¹

¹⁰Based on the response of 125 agency' components to OTA's Federal Agency Data Request.

¹¹Testimony of Peter Marx on behalf of the Information Industry Association before U.S. House of Representatives, Com-

⁷Office of Management and Budget, *Management of the United States Government: Fiscal Year 1986*, January 1985, pp. 17-18.

⁸Office of Management and Budget, *Managing Federal Information Resources*, third annual report under the Paperwork Reduction Act of 1980, June 1984, pp. 8-9; and Office of Management and Budget, *Information Collection Budget of the United States Government*, fiscal year 1985, Apr. 12, 1985.

⁹OMB, *Management of the U.S. Government*, op. cit., pp. 88-91. Some groups, such as Ralph Nader's Public Citizen, believe that public information cutbacks have already significantly impaired agency functions. See Public Citizen, *Starving for Nutrition Information From Reagan's USDA*, August 1984; Public Citizen, *Gasping for Information at Reagan's EPA*, October 1984; and Public Citizen, *Lights Out at DOE: How Reagan Has Put America in the Dark About Energy*, November 1984.

Thus, the information industry seeks to use information technology to help meet public information needs generally on a commercial, for-profit basis. At the same time, public information advocates, such as librarians and university researchers, are concerned that private industry involvement in electronic collection, maintenance, and dissemination of government information may serve to reduce the availability of that information.¹²

Issues raised by the private sector role in the provision of government information have stimulated a large number of conferences, reports, and hearings. For example, in 1982, the National Commission on Libraries and Information Science published a report on *Public Sector/Private Sector Interaction in Providing Information Services*.¹³ Later in 1982, OTA published a technical memorandum on *MEDLARS and Health Information Policy*, which gave major attention to public/private issues.¹⁴ In 1983, the Library of Congress published a report on *Public/Private Interactions: The Implications for Networking*.¹⁵ As a final example, in 1984, OTA issued a technical memorandum on *Remote Sensing and the Private Sector*.¹⁶ There have also been several congressional hearings on the topics of government provision of public information in competition

with the private sector;¹⁷ the Securities and Exchange Commission's Electronic Data Gathering, Analysis, and Retrieval system (EDGAR);¹⁸ electronic collection and dissemination of government information;¹⁹ and OMB draft and final circulars on "Management of Federal Information Resources," in which the private sector is assigned a central role.²⁰

Increasing Use of Electronic Dissemination

OTA found that a significant percentage of Federal agencies (roughly 40 percent of agencies responding to OTA's Federal Agency Data Request) make available or disseminate some public information in an electronic format. The nature and extent of such electronic dissemination varies widely. Of those responding, 47 of 118 agency components reported some electronic activity, including all of the largest public information providers and all of the major Federal statistical agencies, as illustrated in table 7-1.

The most common electronic dissemination activities involve the use of electronic mail (or the equivalent) for the distribution of press releases, bulletins, notices, and short reports, and the use of computer tapes for distribution of statistical databases and reports. Some examples follow:

- *Economic Research Service (Department of Agriculture) - Outlook and Situation*

mittee on Energy and Commerce, Subcommittee on Oversight and Investigations, Mar. 14, 1985, p. 1. Also see A.C. Nielson, *The Business of Information*, report prepared for the Information Industry Association, 1983.

For a summary of concerns expressed by librarians, researchers, and others in response to OMB's draft circular on "Management of Federal Information Resources," see *Information Hotline*, special feature, vol. 17, No. 9, October 1985.

¹³U.S. National Commission on Libraries and Information Science, *Public Sector/Private Sector Interaction in Providing Information Services*, February 1982.

¹⁴U.S. Congress, Office of Technology Assessment, *MEDLARS and Health Information Policy—A Technical Memorandum*, OTA-TM-H-11 (Washington, DC: U.S. Government Printing Office, September 1982).

¹⁵U.S. Library of Congress, Network Development Office, *Public/Private Sector Interactions: The Implications for Networking*, prepared by the Network Advisory Committee, 1983.

¹⁶U.S. Congress, Office of Technology Assessment, *Remote Sensing and the Private Sector: Issues for Discussion—A Technical Memorandum*, OTA-TM-ISC-20 (Washington, DC: (J. S. Government Printing Office, March 1984).

¹⁷U.S. Congress, House of Representatives, Committee on Government Operations, Subcommittee on Government Information and Individual Rights, *Government Provision of Information Services in Competition With the Private Sector*, hearing, 97th Cong., 2d sess., Feb. 25, 1982; see also Representative Glenn English, "Electronic Filing of Documents With the Government: New Technology Presents New Problems," *Congressional Record—House*, Mar. 14, 1984, H 1614-1615.

¹⁸U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Oversight and Investigations, hearing, Mar. 14, 1985.

¹⁹See, for example, U.S. Congress, House Committee on Government Operations, Subcommittee on Government Information, hearing, Oct. 18, 1985.

²⁰See, for example, U.S. Congress, House Committee on Government Operations, Subcommittee on Employment and Housing, hearing, July 17, 1985. Also see Office of Management and Budget, "Management of Federal Information Resources" *Federal Register*, vol. 50, No. 51, Mar. 15, 1985. The final version was issued on Dec. 12, 1985.

Table 7-1.—illustrative Agencies With Some Electronic Dissemination of Public Information

<i>Department of Agriculture</i>
Economic Research Service
Statistical Reporting Service
Food and Nutrition Service
Human Nutrition Information Service
Rural Electrification Administration
Department of Commerce
Census Bureau
Bureau of Economic Analysis
International Trade Administration
National Bureau of Standards
National Technical Information Service
Patent and Trademark Office
Department of Energy
Energy Information Administration
Federal Energy Regulatory Commission
<i>Department of Health and Human Services</i>
National Center for Health Statistics
Centers for Disease Control
Food and Drug Administration
Social Security Administration
<i>Department of the Interior</i>
Fish and Wildlife Service
U.S. Geological Survey
Bureau of Mines
<i>Department of Justice</i>
Bureau of Justice Statistics
National Institute of Justice
<i>Department of Labor</i>
Bureau of Labor Statistics
<i>Department of Transportation</i>
National Highway Traffic Safety Administration
Urban Mass Transportation Administration
Consumer Product Safety Commission
Federal Communications Commission
Federal Election Commission
Federal Emergency Management Agency
Federal Reserve System
National Aeronautics and Space Administration
Small Business Administration

SOURCE Office of Technology Assessment.

reports are electronically disseminated through AGNET, a computer system operated by the University of Nebraska. The reports are 32 to 40 pages in length (text and tables), number roughly 100 per year, and are also available for purchase in hardcopy form through GPO. The electronic reports are derived directly from the ERS word-processing system, transmitted to AGNET, and available via dial-up telecommunications. AGNET controls the fees and access. Users range from individual farm operators to the Govern-

ment of New Zealand to value-added information providers (e.g., agricultural newsletters).

- *Bureau of the Census (Department of Commerce)* –Selected Census data are available on-line via a commercial vendor–Dialog Information Services and the Glimpse Corp. Called CENDATA, the on-line dial-up service also includes Bureau news releases, user news bulletins, and product information. Census anticipates that CENDATA offerings will gradually increase over time. Census also sells data sets in computer tape and diskette format, and distributes the data tapes at no charge to the 50 State census data centers.
- *National Bureau of Standards (Department of Commerce)* –Various computer tapes generated by NBS scientists and engineers are made available through the National Technical Information Service (NTIS). Also, the NBS National Standard Reference Data System provides databases (of physical and chemical properties of substances) on magnetic tapes and through on-line computer networks, as well as in printed form.
- *Various Health and Human Services Agencies*–The National Center for Health Statistics makes over 400 data files available on computer tape, generally via NTIS. The Food and Drug Administration uses ITT Dialcom for an “electronic bulletin board” on a trial basis; electronic notices are also available in paper form. The Social Security Administration places selected SSA data in a CompuServe information service that is available on a dial-up basis.
- *National Highway Transportation Safety Administration (Department of Transportation)*–NHTSA maintains a Vehicle Biomechanics Testing Data Base that started in 1978 and currently contains data on 800 vehicle crash tests and 900 occupant crash tests. The database is available directly from NHTSA via computer tape and dial-up access, and is free. NHTSA also has a toll-free Auto Safety Hotline for consumer safety information, and

manages a technical reference service for highway safety information.

- *National Aeronautics and Space Administration* —NASA has offered NASA NEWS since fall 1984. NASA NEWS is an electronic database containing press releases, shuttle status reports, flight schedules, etc.; it is available on a dial-up basis from NASA headquarters and field offices via the NASA contractor, Dialcom. Users include government agencies, contractors, news media, and libraries. NASA also maintains an aerospace database that includes about 1.5 million references and abstracts of reports and journal articles. The database is available in computer tape format via commercial vendors working under an arrangement with the American Institute of Aeronautics and Astronautics (the NASA contractor).

Agency Planning for Government Information Revolution

Despite the fairly widespread agency use of electronic dissemination of government information, such use is still largely in the formative stages. Electronic information accounts for only a small percentage of the total government information flow. However, the results of OTA's Federal Agency Data Request and examination of selected agency activities and plans strongly suggest that major changes are likely. Several agencies are experimenting with various new technologies and planning for expanded use of several that bear directly on government information functions.

The heaviest area of current activity appears to be with respect to computerized databases. There are estimated to be several thousand in the Federal Government already, and several agencies are studying new or expanded use of computerized databases.

As an illustration of a recently completed (March 1985) study, the Federal Election Commission (FEC) evaluated a pilot project on direct electronic access to Federal campaign finance data. The pilot project permits eight

State campaign finance offices in seven States to access FEC data directly. The study concluded that this concept could be usefully extended so that FEC data would be electronically available at terminals in all States and major cities. This is viewed by the FEC as enhancing the mission objective of making Federal campaign finance data widely available to government officials, the media, candidates, political action committees, party committees, academics, and researchers.²² Continuation of the electronic access project is uncertain in light of possible agency budget reductions.

A March 1984 NBS workshop on the effect of computers on the generation and use of technical data concluded that technical databases are essential to U.S. industry and that electronic dissemination has significant advantages. These include the ability to locate desired data more reliably and quickly, update the data in a more timely fashion, and transfer the data more accurately and less expensively.²²

As a third example, in 1984, the Federal Communications Commission (FCC) concluded an inquiry into the possibility of allowing the public direct electronic access to FCC computerized databases. Various respondents expressed the desire to have faster and more accurate access to FCC data of interest. After deliberating on cost, technical, security, and other considerations, FCC decided to select a contractor to make certain that their files were available to the public on a commercial basis at a reasonable cost, with NTIS acting as account manager for a third-party contract between the FCC and a vendor.²³

As a final example, the National Center for Health Statistics (NCHS) has a well-developed publications survey form. The form goes out

²²U.S. Federal Election Commission, *State Computer Access to FEC Federal Campaign Finance Data: Report of a Pilot Project*, March 1985.

²³U. S. Department of Commerce, National Bureau of Standards, *The Effect of Computers on the Generation and Use of Technical Data*, report of a workshop, June 1984.

²⁴U.S. Federal Communications Commission, General Docket No. 83-483, Report and Order, In the Matter of Allowing the Public Direct Remote Access to Commission Computer Data Bases, Aug. 13, 1984.

over the signature of the NCHS Director and asks respondents, among other things, if they are not interested, somewhat interested, or very interested in purchasing NCHS information by:²⁴

- *electronic release*—direct access through computer terminals to the latest NCHS data in summary or detailed form;
- *direct computer access* to NCHS reports prior to publication;
- *automated bibliographic system*—direct access through computer terminals to an index of NCHS published and unpublished data to determine the availability of specific types of data;
- *data networks-access* to printed and computer products, as well as assistance in locating and using data at a regional or State center on a cost basis; and
- *Phone-in data line*—a users call-in service for obtaining the latest summary data on selected topics, such as monthly vital statistics data.

Several of these applications come very close to, if not actually embracing, printing-on-demand or remote electronic printing—whereby, for example, government documents would be stored in electronic form and transmitted electronically to the location of the user where a hardcopy would be printed out. In response to the OTA Federal Agency Data Request, 21 out of 114 agencies reported use of printing-on-demand or remote electronic printing. It appears that such use is primarily for internal purposes at the present time, but the opportunities for use in dissemination of government information are significant. A 1982 study prepared for the Energy Information Administration concluded that they were not taking advantage of electronic publishing options that could reduce costs and increase quality and timeliness.²⁵ Private sector devel-

opment and use of electronic printing and publishing technologies are growing rapidly.”

In addition, agencies already report significant use of electronic mail and audioconferencing, and emerging use of computer-conferencing, videoconferencing, and optical disks. All of these technologies have direct application to dissemination of government information. The number of agencies using optical disks is projected to quintuple, the number using videoconferencing is projected to triple, and the number using computer-conferencing is projected to double, based on current plans.

Technology	Current use		Planned use	
	Number*	Percent	Number	Percent
Electronic mail	97	7270	115	869.
Audioconferencing	84	63	86	64
Computer-conferencing	16	12	29	22
Videoconferencing	10	8	30	22
Optical disks	6	4	39	29

* Based on 134 agencies responding to this part of OTA's Federal Agency Data Request

In sum, the actions and plans of individual Federal agencies clearly indicate that electronic information technology is destined to become an increasingly significant part of government information functions. A good illustration is the year 2000 planning scenario of the Defense Technical Information Center (DTIC), summarized below:²⁷

DTIC will be a highly automated operation where the vast majority of data transfers are electronic. It will be situated in an environment where all users have access to computer work stations; where computer storage has the density, access speeds, and reliability to permit full-text storage of all items; . . . where mailing of paper products has been replaced by electronic transmissions; [and] where the power/speed of computers and the sophistication of software eliminate the need for both manual indexing and development of intricate search strategies.

²⁴See, for example, Andrew Parker, “A Colourful Revolution in Printing,” *New Scientist*, Sept. 26, 1985, pp. 52-55; Erik Sandberg-Diment, “Desktop Publishing Comes of Age,” *New York Times*, Nov. 26, 1985, p. C4; Johanna Ambrosio, “Publishing In-House Can Sharpen DP Image,” *Computerworld*, Dec. 2, 1985; and Patricia McShane, “Printing With Light Speed,” *Computer Decisions*, Dec. 17, 1985, pp. 78-81.

²⁵U.S. Department of Defense, Defense Logistics Agency, Defense Technical Information Center, *DTIC 2000: A Corporate Plan for the Future*, DTIC/TR-84/3, July 1984.

²⁴U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, *NCHS Publications Survey*, no date.

²⁵Henry B. Freedman, *A Technology Assessment of Electronic Publishing Options for the Energy Information Administration National Energy Information Center*, March 1982.

KEY ISSUES

OTA identified several issues that warrant further study and may, ultimately, require congressional action. The purpose here is to identify issue areas and some possible options—not to analyze the issues in depth or develop and evaluate options in any detail.²⁸

Further Study of Cost-Effectiveness of Electronic Information Options

Many agencies are moving ahead on the assumption and belief that electronic collection, maintenance, and dissemination of government information is cost-effective. The results of those agency studies reviewed by OTA suggest that this may be the case. However, most agencies engaged in electronic dissemination have not conducted such a study; nor has there been a governmentwide study on this topic.

Based on the results of the OTA Federal Agency Data Request, only 10 agencies (9 percent of all 125 agencies responding; 21 percent of agencies using electronic dissemination) report any kind of study on the impacts of electronic dissemination.

If indeed the information currently available is not adequate as a basis for public policy-making, one or more of the following options could be pursued:

1. further studies by specific agencies (e.g., in the process of authorization and appropriation actions);
2. preparation of a governmentwide report by one of the central agencies (e.g., Office of Information and Regulatory Affairs/OMB; Office of Information Resources Management/General Services Administration (GSA); Institute for Computer Science and Technology/NBS); and/or

²⁸For further discussion, see McClure and Herson, *Public Information*, op. cit. Also, OTA has already been asked to examine many of these issues in detail, as outlined in a letter from Senator Charles McC. Mathias, Chairman, and Representative Frank Annunzio, Vice Chairman of the Joint Committee on Printing, U.S. Congress, to OTA Director John H. Gibbons, dated May 17, 1985. Related letters of request were sent to the General Accounting Office and Government Printing Office with respect to work complementary to that requested of OTA.

3. studies by one or more of the congressional support agencies (i.e., Congressional Budget Office, Congressional Research Service, General Accounting Office (GAO), OTA).

Equity of Access to Electronic Government Information

One of the most basic issues involves the extent to which electronic options affect the relative availability of government information to various publics. As noted earlier, the importance of government information is reflected in numerous public laws, but also in the strongly held views of librarians, educators, researchers, public interest groups, the press, and others who believe that government information is an important public good and central to the fabric of American society.”

The core issue is whether the shift from a substantially paper-based to a largely electronic-based government information system will, absent policy intervention, create new inequities and barriers to access. One concern is that electronic dissemination will advantage primarily those with the funds and/or technical sophistication needed to use computerized databases. This concern is amplified to the extent that electronic dissemination is viewed as a luxury or special service and offered on a cost recovery and/or market pricing basis. An alternative approach would be to establish the electronic format as the primary format, to be widely accessible by citizens and interested

²⁹See, for example, Lewis M. Helm, Ray Eldon Hiebert, Michael R. Naver, and Kenneth Robin, *Informing the People* (New York: Longman, 1981); Donna A. Demac, *Keeping America Uninformed: Government Secrecy in the 1980* (New York: The Pilgrim Press, 1984); Carol A. Tauer, “Social Justice and Access to Information,” *Minnesota Libraries*, summer 1982, pp. 39-42; Marc A. Levin, “Access and Dissemination Issues Concerning Federal Government Information,” *Special Libraries*, April 1983, pp. 127-137; Mimi Abramovitz, “Secrecy in the Welfare State,” *Social Policy*, spring 1985, pp. 52-55; numerous statements submitted in response to OMB’s draft circular on “Management of Federal Information Resources” as abstracted in *Information Hotline*, October 1985; and Eugene Garfield, “Society’s Unmet Information Needs,” *ASZS Bulletin*, October/November 1985, pp. 6-7.

publics, with paper copies viewed as a luxury or special service.

In reality, the situation is far more complex, since there is a range of users with different needs, motivations, and abilities to pay. For example, the additional cost of obtaining financial information from the Securities and Exchange Commission (SEC) in electronic form may be insignificant to a trade association or private firm, but substantial to a graduate student or researcher. And the value of information to the government and the user also varies widely. Thus, public policy may determine that health and safety information should be disseminated without cost to the user and as expeditiously as possible, whereas trade or industrial market information should be priced on a full cost-recovery basis.

In sum, the equity issue is complex, and involves a wide range of government information categories, public policy objectives, user groups, and dissemination technologies. At present, Federal agencies formulate their public information strategies within an equally complex set of public laws and OMB rules and regulations. The shift to electronic collection, storage, and dissemination strategies appears to be aggravating these already difficult policy choices, to the extent that Congress may need to provide revised or new guidance.

Private Sector Role in Federal Electronic Information Activities

Another basic issue involves the appropriate role (or, more realistically, roles) of private firms in the collection, maintenance, and dissemination of government information. The information industry is predicated on the use of information technology, and as the government shifts to greater emphasis on using the technology, opportunities for conflict, competition, and cooperation will inevitably increase.

An example of cooperation is the Department of Agriculture (USDA) electronic database for time-sensitive data such as market, crop, and livestock reports, economic outlook reports, and the like. USDA contracted for a

private vendor on a competitive basis, and ultimately selected Martin Marietta Data Systems. Martin Marietta agreed to utilize standard rates, accept whatever data USDA placed on the system, release the data for equal access to all users, according to the USDA schedule, and delete the data when requested by USDA. Martin Marietta further agreed to an anti-competitive provision prohibiting its resale of the data at retail, thus removing a potentially unfair competitive advantage. The system provides data and reports instantaneously in electronic format. This is an example where the government agency (USDA) has retained complete control over the data. But even here, an equity issue still exists because users who want instant electronic access must pay an extra charge, however nominal (\$150 per month minimum fee), and must have an electronic terminal, thus potentially disadvantaging users who lack the money, equipment, or both.³⁰

An example of competition is the Department of Labor (DOL) proposal to make key statistical data on the labor force, price indices, unemployment, and the like available to the public in on-line electronic format via NTIS. The data were to have been provided in chart and tabular as well as raw form. A private firm, Data Resources, Inc., saw this proposal as direct competition and opposed implementation. In part as a result, DOL withdrew the proposal.³¹ But this situation raises the issue of whether and when government provision of public information should be limited to those areas where there is no current or potential private vendor.

Finally, two examples of conflict are the electronic filing project of SEC and the electronic trademark database project of the Patent and

³⁰Roxanne Williams, "Getting the Word Out: The Agriculture Department's New System for Electronic Dissemination of Time Sensitive 'Perishable' Data," *Government Data Systems*, June/July 1985, pp. 28-29; "USDA's Computerized Information Service," *Information Hotline*, September 1985, pp. 3-4.

³¹Reinhardt Krause, "Policy Shift: Using the Private Sector to Market Federal Databases," *Government Data Systems*, June/July 1985, pp. 25-26.

Trademark Office (PTO). In both cases, automation is generally regarded as potentially cost-effective. But SEC sought to finance the computerized system for corporate filings through an exchange agreement with a private vendor, whereby the vendor would recover the costs of system development and operation through user fees for basic services and sales of value-added services. The vendor would have exclusive rights to the sale of on-line bulk data. Likewise, PTO sought to finance the preparation of a computerized database for its trademark registration information by exchange agreements with private vendors, whereby the vendors would receive free copies of present and future trademark information and be granted restrictions on public access to advanced search functions. This apparently was intended to protect the vendors' value-added markets. PTO subsequently relaxed the public access restrictions, but imposed a royalty fee that was to be passed on to the vendors.³²

The SEC and PTO electronic information projects have raised numerous questions, such as the impact on public access and industry competition; the use or misuse of exchange agreements; whether Federal procurement laws and regulations have been properly followed; the adequacy of cost-benefit and feasibility studies; potential conflict of interest with vendors; and whether and under what conditions vital government information should be under the control of, and accessible only through, private firms.³³

³²On the SEC project, see statements of James Watts of GAO and Peter Marx of the Information Industry Association before the Mar. 14, 1985, hearing of the Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce; on the PTO project, see U.S. Comptroller General, *Patent and Trademark Office Needs to Better Manage Automation of Its Trademark Operations*, GAO/IMTEC-85-8, Apr. 19, 1985, and testimony of Thomas P. Giammo before the Oct. 18, 1985 hearing of the Subcommittee on Government Information, House Government Operations Committee.

³³See Mitch Betts, "Congress Steps Up Role in Federal Automation Projects," *Computerworld*, July 15, 1985; and statements of Guy Blynn of the U.S. Trademark Association and Herbert Wamsley of the Intellectual Property Owners, Inc., before the Oct. 1, 1985, hearing of the Subcommittee on Government Information, House Government Operations Committee.

In a broader context, these issues are particularly significant given that the OMB draft circular on "Management of Federal Information Resources" emphasizes reliance on the private sector and user charges. For example, the circular, while recognizing that government information dissemination can be necessary and even essential to agency missions, permits such dissemination by the government itself only if the information product or service is not already provided by other government or private sector organizations or could not reasonably be provided by such organizations in the absence of agency dissemination.³⁴ And, while the draft circular notes that dissemination should be conducted "in a manner that reasonably ensures the information will reach . . . the public . . .," the circular requires that "maximum feasible reliance" be placed on the private sector for dissemination and that costs of dissemination be recovered through user charges, where appropriate.³⁵

The final version of the OMB circular issued in December 1985 gives more explicit recognition to the importance of government information. For example, the circular states that "government information is a valuable national resource," and "[t]he free flow of information from the government to its citizens and vice versa is essential in a democratic society."³⁶ However, the circular still places heavy emphasis on the private sector. Thus, Federal agency dissemination must be either "[s]pecifically required by law" or "[n]ecessary for the proper performance of agency functions, provided that the information products and services disseminated "do not duplicate similar products or services that are or would

³⁴Office of Management and Budget, "Management of Federal Information Resources," *Federal Register*, vol. 50, No. 51, Mar. 15, 1985, Section 8(a)(8).

³⁵*Ibid.*, Section 8(a)(g). For further discussion, see Harold C. Relyea, Jane Bortnick, and Richard C. Ehlke, *Management of Federal Information Resources: A General Critique of the March 1985 OMB Draft Circular-Matters for Possible Congressional Consideration*, Congressional Research Service, Library of Congress, July 5, 1985.

³⁶Office of Management and Budget, Circular No. A-130+ "Management of Federal Information Resources," Dec. 12, 1985, Sections 7(a) and (b).

otherwise be provided by other government or private sector organizations.³⁷ The circular continues to require that "maximum feasible reliance" be placed on the private sector for dissemination, and that costs be recovered through user charges, where appropriate.³⁸ The final version of the circular cites OMB Circulars A-76 and A-25 as authorities for maximum feasible reliance on the private sector and for user charges. The draft version implied that these provisions were based on the Paperwork Reduction Act or other general statutory authority.

In sum, OMB appears to have tacitly acknowledged that aspects of the circular dealing with information dissemination do not have the clear congressional guidance originally assumed. Nonetheless, OMB has used its discretion and general authority to finalize the circular's emphasis on the private sector, even though Representative Glenn English, Chairman of the House Committee on Government Operations, Subcommittee on Government Information, among others, had requested that the draft circular be reconsidered.

Institutional Responsibility for Government Information Policy and Operations

The shifting of the Federal Government toward greater electronic information collection, maintenance, and dissemination appears to be further aggravating conflicts over the role of OMB, the Joint Committee on Printing, and GPO with respect to public information policymaking. It also is aggravating conflicts between OMB and various other congressional committees with respect to the applicability and interpretation of the Paperwork Reduction Act, and between GPO and NTIS and other Federal printing and electronic dissemination agencies over future operational responsibilities.

OMB has taken the position that electronic-based information dissemination by executive

branch agencies falls outside of the definition of printing and binding in chapter 5 of Title 44 of the U.S. Code. In addition, the U.S. Department of Justice has interpreted the Supreme Court's decision in *INS v. Chadha*³⁹ (that struck down the legislative veto as unconstitutional) as invalidating parts of chapter 5 of Title 44 relating to the control of GPO over executive agency printing decisions. The printing chapters of Title 44 were originally enacted as the Public Printing Act of 1895 and were remodified in 1968 by Public Law 90-620. Prior efforts to enact a major revision to the printing chapters of Title 44 have not reached fruition. Thus, Title 44 has not yet been fully updated in light of modern information technology. Congress may wish to include this issue as part of a comprehensive review and revision of Federal public information policies.

The Paperwork Reduction Act of 1980 does provide clear congressional guidance, both in the language of the act and the legislative history, on the need to minimize the Federal paperwork collection burden, establish coordinated and uniform Federal information policies, and minimize the cost to the government of collecting, using, and disseminating information.⁴⁰

At the same time, the act and its legislative history show that the need to maximize public access to government information was also intended by Congress. For example, the purpose of the act is, among other things, "to maximize the usefulness of information collected by the Federal Government,"⁴¹ and the Senate report states that:

The Committee expects the Director [of the Office of Information and Regulatory Affairs] to take appropriate steps to maximize public access to the information the Federal Government collects.⁴²

The Federal Information Locator System, which the PRA of 1980 required OMB to es-

³⁷Ibid., Sections 9(a) and (b).

³⁸Ibid., Sections 1 l(b) and (c).

JY103 S. Ct. 2764 (1983).

⁴⁰44 U.S.C. 3501 (1) and (2).

⁴¹44 U.S.C. 3501(3).

⁴²S. Rep. No. 96-930, p. 33.

publish, was also intended to help serve this purpose.”

In addition, several new issues have arisen since enactment of the PRA in 1980. The congressional debate leading up to enactment of the PRA in 1980 did not consider many of the current issues, such as equity and private sector involvement in electronic systems, because these issues had not yet developed. Agency plans and practices for electronic government information systems reached threshold levels of visibility and significance only in the last few years. Also, the PRA debate, with a focus on government paperwork and information management, did not explicitly consider the numerous public laws that assign government information functions to numerous Federal agencies. In sum, PRA provides, at best, limited and mixed guidance to OMB with respect to the electronic collection, maintenance, and dissemination of government information. Congress may wish to update and clarify its intent with respect to the public information aspects of PRA through appropriate amendments and/or oversight and authorizing reports.

With respect to operational responsibilities for government information dissemination, historically GPO and national libraries have had a primary role. However, as a result of the increasing volume of government information—in many cases mandated by statute—coupled with the transition to electronic systems, NTIS and several of the agencies also have become major disseminators of government information. GPO, NTIS, the national libraries, and several agencies have developed numerous electronic and computer-based information products and services. For example, GPO makes the U.S. Code, Congressional Record, and Federal Register available in computer tape format to private publishers and information providers. Also, GPO makes its catalog to government publications available to depository libraries in an on-line electronic format.

And NTIS has expanded far beyond paper or microfiche copies of printed reports to include bibliographic, database, software, and related functions in cooperation with numerous other Federal agencies. These NTIS activities include, for example:

- *computer* software—more than 500 software programs, from more than 100 Federal agencies, available for purchase in magnetic computer tape format;
- *energy* software—more than 730 programs available for purchase in cooperation with the Department of Energy National Energy Software Center;
- *computerized data* files—about 1,000 data files are available in computer tape format;
- *floppy diskette* files—about 60 files available in diskette format (also, any computerized data file can be converted);
- *energy modeling* programs—about 55 computer modeling programs available on computer tape; and
- *other databases*—from the Defense Logistics Supply Center, Human Nutrition Information Service (USDA), and National Center for Health Statistics (DHHS).

In 1979 an advisory group appointed by the Joint Committee on Printing considered the possibility of establishing a new central office combining the functions of GPO, NTIS, and OMB with respect to public information policy, in order to facilitate public access and eliminate duplication. A National Publications Act of 1980 was introduced to establish a National Publications Office along with a commission that would replace the Joint Committee, but the bill was not enacted.⁴⁴

⁴⁴See Levin, “Access and Dissemination Issues,” *op. cit.*, pp. 129-130; U.S. Congress, Joint Committee on Printing, Ad Hoc Advisory Committee on Revision of Title 44, *Federal Government Printing and Publishing: Policy issues*, Washington, DC, 1979; and “National Publications Act of 1980,” 96th Cong., 2d sess.

¹⁴⁴ U. S. C. 3501 (2)(B) and (D).

Public Information Index or Clearinghouse

Whether or not Congress establishes a centralized public information office, a centralized index to or clearinghouse of government information could be setup and operated by an existing or new entity. The library community has strongly advocated the need for such an index or clearinghouse, given the very large amount, numerous types, and many locations of government information.

One specific opportunity that has not been fully realized is the further development of the Federal Information Locator System (FILS) (or the equivalent) into a governmentwide electronic directory of public information products—both electronic- and paper-based. In enacting the Paperwork Reduction Act of 1980, Congress specifically required OMB to establish FILS and develop a proposal to augment it to include data profiles of all major agency information holdings.⁴⁵ The U.S. Senate report accompanying the act states that FILS is to:⁴⁶

1. identify duplication in agencies' reporting and recordkeeping requirements;
2. locate existing information that may meet the needs of Congress, executive agencies, and the public; and
3. assist in deciding which agency requests for information collection should be approved.

FILS is now operational, but is designed and used primarily for #1 above, secondarily for #3, and not at all for #2. A National Bureau of Standards study (sponsored by OMB) of possible FILS improvements has been completed, but did not address objective #2.⁴⁷

The further development of FILS or the equivalent should be able to build, to some extent, on the prior work of the many agencies that have a directory or catalog of their own public information products. Indeed, 67 out

of 119 agencies (or 56 percent) responding to the OTA Federal Agency Data Request indicated the existence of a directory or catalog, and this included almost all of the largest public information providers (e.g., Census, NTIS, NCHS, Energy Information Administration (EIA), U.S. Geological Survey, and the National Institute of Justice).

The directories are mostly in a paper format, although some agencies also have or contract for computerized bibliographic services, and many agency reports and documents are indexed in various government and commercial on-line information retrieval systems. For example, GAO publishes a directory titled *Federal Information Sources and Systems* that is available in paper format and on the SCORPIO (Library of Congress) information retrieval system.⁴⁸ And a private publisher produces *The Computer Data and Database Source Book* in both hardcopy and electronic format (the latter via NewsNet).⁴⁹

Mechanisms for Exchange of Learning and Innovation

Despite the activities of various individual Federal agencies, there appears to be no effective governmentwide mechanism to exchange learning and take advantage of the full range of innovative opportunities presented by information technology to facilitate access to and dissemination of public information.

The public information area appears to have received relatively little attention from the central agencies for information technology management—OMB, NBS, and GSA. There is little evidence of an organized effort to share experience and learning across agency lines, and to help derive the most benefit from agency experiments with and innovative applications of information technology for public information purposes. One or more of the central agencies could take on a larger role in this area,

⁴⁵Public Law 96-51 1; Section 3505 (2)(B) and (D).

⁴⁶S. Rep. No. 96-930, p. 2.

t-u. s. Department of Commerce, National Bureau of Standards, *Recommendations for the Improvement of the Federal Information Locator System*, October 1984.

⁴⁸U.S. Comptroller General, *Federal Information Sources and Systems 1984*, GAO/AFMD-85-3, General Accounting Office.

⁴⁹Matthew Lesko, *The Computer Data and Database Source Book* (New York: Avon, 1984).

and/or some other agency or agencies whose primary mission is public information (e.g., the Bureau of Labor Statistics, EIA, GPO, NTIS) could be asked to serve as a focal point for the exchange of learning and innovation.

Several examples of agency innovation have been cited previously. Two others include TradeNet and the Microcomputer Electronic Information Exchange. TradeNet is a computer-based electronic network that includes databases, analytic software, electronic mail, and other automated capabilities with respect to information relevant to international trade policy. Several agencies (e.g., the Office of the U.S. Trade Representative; Departments of Agriculture, Commerce, and Labor) pooled resources to develop a more accurate and timely information base on trade policy—drawing from U.S. Government, international, and private sector sources. TradeNet's central files are maintained at the National Institutes of Health computer center, and files are accessed electronically in real-time or by downloading to mini- and micro-computers.⁵⁰ Another approach is the electronic bulletin board, illustrated by the Microcomputer Electronic Information Exchange, operated by NBS. This is a public bulletin board that provides information on microcomputer: courses, access to other bulletin boards, user groups and meetings, security products and issues, and technical information, among other topics.⁵¹

Some technological opportunities that do not, as yet, appear to be receiving very much governmentwide attention include: remote electronic printing and printing-on-demand for dissemination of government reports to the public; computer-assisted surveys and data collection for statistical purposes; videotex (or the equivalent) information systems networked with depository and public libraries; and microcomputer-based systems for individual access to the major public information databases.

⁵⁰ Harry Goldberg, "TradeNet: Enhanced Accuracy & Economy Result From Interagency Data Pooling," *Government Executive*, vol. 17, No. 1, January 1985.

⁵¹ For more information, the dial-up number is (301) 948-5718 (ASCII, 1200 baud, 8 or 7 data bits, even or no parity, 1 stopbit).

The Canadian Government's nationwide videotex-based public information system is one example of what is technically feasible. More than 2,000 videotex terminals have been located in government agencies, libraries, and other public places. A wide variety of information is available—ranging from a nationwide job bank, weather forecasts, and national park services to the status of bills in Parliament. The public has free access at public buildings (e.g., libraries, post offices), and can, for a fee, gain access via personal computers." Another example is a recently launched European electronic publishing program that is aimed at providing a complete service for the electronic storage, transmission, and delivery of documents. This program is being run by a group of publishers, software houses, computer service bureaus, and governmental entities. Technologies include user-friendly videotex, digital optical disks, high-speed telecopy, and satellite transmission.⁵³

Freedom of Information Act Implementation

OTA found that very few Federal agencies are directly using information technology to facilitate the processing of FOIA requests, and the results of these few applications are not being effectively shared. Possible opportunities for innovation are neither being studied nor tested.

The response to the OTA Federal Agency Data Request indicated that few agencies receive or respond to FOIA requests in electronic form. A handful of agencies are just beginning to consider the possibilities, although

⁵³ "Canada Sets Pace in Making Government Accessible to All," *Government Executive*, February 1985, pp. 37-41.

⁵⁴ "European Electronic Publishing Program," *Information Hotline*, February 1985, p. 4. See also, for discussion of proposals for U.S. innovations, National Commission on Libraries and Information Science and U.S. Department of Agriculture, *Joint Congressional Hearing on the Changing Information Needs of Rural America: The Role of Libraries and Information Technology*, July 21, 1982; National Commission on Libraries and Information Science, *Communist Information and Referral Services*, May 1983; and U.S. Congress, Joint Committee on Printing, *Provision of Federal Government Publications in Electronic Format to Depository Libraries*, 98th Cong., 2d sess., 1984.

only one agency (the Federal Aviation Administration) reported a completed, ongoing, or planned formal study on this topic.

Some agencies are using computerized systems to improve the internal tracking and processing of FOIA requests, with apparently good results. Other agencies recognize that computerized records can, in general, speed up processing time. However, these positive experiences do not appear to be shared effectively with other agencies.

Beyond this, however, several States appear to be ahead of the Federal Government in their consideration of electronic public access to government information. For example, the State of California commissioned a study on electronic public access that concluded that:

The opportunities [of direct electronic access] revolve around the possibility of making government—particularly the records of government—more readily accessible to the people of California. On-line inquiry, when coupled with powerful computerized file search capabilities, creates the possibility of employing public information as a true public resource, accessible to a much larger segment of the population than was possible in the past.⁵⁴

However, the study also identified a number of issues that needed resolution, including: 1) meeting the public's right to know while protecting the individual's right to privacy, 2) ensuring the proprietary rights of individuals and commercial enterprises, 3) providing adequate security, and 4) establishing fair and equitable prices.

A similar study was conducted by the Florida State Legislature's Joint Committee on Information Technology Resources. This study examined a wide range of issues raised by proposals to permit direct computer access to

⁵⁴State of California, Department of Finance, Office of Information Technology, "Accessing California State Data Bases: A Preface to 'Framework to Develop Computer Information Public Access Policy,'" Dec. 26, 1984; see generally, Touche Ross & Co. and EDP Audit Controls, Inc., *Framework To Develop Computer Information Public Access Policy*, prepared for the Office of Information Technology, California State Department of Finance, Jan. 1, 1985.

public records. The Joint Committee found that the majority of Florida's State public record systems had been automated, and recommended, among other things, that:

- remote electronic access to automated information systems maintained by public record custodians should be authorized by statute and encouraged as a matter of public policy;
- a pilot project demonstrating remote electronic access to State automated records should be undertaken;
- public record custodians should be allowed to charge for costs of computer time in fulfilling requests for copies of public records, but only after uniform cost methodologies are established in statute and rules; and
- access to all State data systems should be made available to elected members of the Florida Legislature.⁵⁵

Florida's analysis, as did California's, recognized the need to consider Privacy and Public Records (or Freedom of Information) laws; security, training, and cost recovery issues; technical concerns; responsibility for record quality and archiving; and the broader implications for citizen participation in government when formulating policy on electronic access.

An emerging issue identified in OTA's review of innovative activities in selected States (Michigan, Virginia, Oregon, and North Carolina, in addition to California and Florida) is the extent to which public records or databases, when computerized in an on-line format, become legally accessible to the public—regardless of whether or not such information is already provided by private vendors. For example, public access advocates argue that once government agencies computerize information on scheduling of public meetings and hearings, minutes and proceedings resulting from public activities, current status of regulatory and

⁵⁵State of Florida, Legislature, Joint Committee on Information Technology Resources, *Remote Computer Access to Public Records in Florida*, January 1985. Also see Donna Raimondi, "Florida Bill Proposes Electronic Access Into Agencies," *Computerworld*, Apr. 1, 1985, p. 19.

legislative initiatives, and the like, this electronic information should be accessible to the public—at little or no cost.”

The selected State review (plus a review of activities in selected localities—Lane County, Oregon; Columbus, Ohio; and Beverly Hills, Irvine, Pales Verdes, and Buena Park, California) concluded that the two information technology applications with the greatest real potential for facilitating public access are:

1. electronic access to information about the process and results of government activities, especially decisionmaking activities; and
2. access to the databases and computer models used by government agencies to formulate positions on various sides of the issues.⁵⁷

The review identified a wide range of technical options—from cable television and videotex to microcomputer access over electronic data networks—but concluded on a note of caution. Many past expectations about using information technology to facilitate public access have not been met—sometimes due to lack of citizen interest and sometimes because the groups using the new electronic options are those that already have the resources and sophistication to get access now, among other factors. In sum, information technology appears to offer significant potential to facilitate implementation of public records and freedom of information laws—whether at the Federal, State, or local levels. But realizing this potential depends in large part on an interested and educated citizenry and the absence of any significant technical or cost barriers.⁵⁸

⁵⁷See generally Kenneth L. Kraemer, John Leslie King, and David G. Schetter, *Innovative Use of Information Technology in Facilitating Public Access to Agency Decisionmaking: An Assessment of the Experience in State and Local Governments*, OTA contractor report, March 1985.

⁵⁸Ibid., pp. 44-49.

⁵⁹Ibid.; also see, for example, Bruce Gates, “Knowledge, Networks, and Neighborhoods: Will Microcomputers Make Us Better Citizens?” *Public Administration Review*, March 1984, pp. 164-169; and William Dutton, et al., “Electronic Participation by Citizens in U.S. Local Government,” *Information Age*, April 1984, pp. 78-97. For some of the earliest work on this topic, see John D.C. Little, Thomas B. Sheridan, Chandler H. Stevens, and Peter Tropp, *Citizen Feedback Components and Systems* (Cambridge, MA: MIT, June 1972); Norman Johnson and Ed-

Electronic Recordkeeping and Archiving

The growing use of information technology in the creation and maintenance of Federal records could have a profound effect on the recorded history of Federal programs and decisions, and thus could affect the record base subject to the FOIA in particular and public access in general. If key Federal records were electronically erased or destroyed, the FOIA and public access mechanisms, however strong, would be undermined.

The increase in computerized files, but most significantly the explosion in microcomputer and word processing terminals, means that record creation and recordkeeping have been decentralized. File clerks and secretaries no longer have clear physical control over records management. Agency staff who use word processing software are able to create, manipulate, file, review, delete, and communicate documents. If those documents meet the definition of Federal records, then legally these records should be retained to preserve the documentation for different steps in the decisionmaking process.

Record managers, researchers, historians, and archivists are properly concerned that key Federal records may be lost, altered, or destroyed by agency staff who do not understand Federal record management requirements. The National Archives and Records Administration (NARA), GSA, and Senate Historical Office, among others, have pointed out the need to develop educational, training, technical, and policy strategies to deal with this potential problem. These agencies have emphasized that now is the time to address

ward Ward, “Citizen Information Systems: Using Technology To Extend the Dialogue Between Citizens and Their Government,” *Management Science*, December 1972, pp. p-21 to p-34; Chandler Harrison Stevens, Floyd E. Barwig, Jr., and David S. Haviland, *Feedback: An Involvement Primer* (Troy, NY: Rensselaer Polytechnic Institute, January 1974); Roy Amara, *Toward Understanding the Social Impact of Computers* (Menlo Park, CA: Institute for the Future, May 1974); and Fred B. Wood, “Congressional-Constituent Telecommunication: The Potential and Limitations of Emergent Channels,” *IEEE Transactions on Communications*, vol. 23, No. 10, October 1975, pp. 1134-1142.

these questions while Federal agencies and employees are still learning about, and developing policies and procedures for, microcomputer use.

As a result, NARA and GSA recently issued preliminary guidelines for agencies regarding electronic recordkeeping, and have initiated major projects to further research the records management problems presented by the creation, maintenance, use, and disposition of electronic records. The wide scope of concern is illustrated by the topics covered in the preliminary bulletin:

- electronic records creation practices,
- indexing electronic records,
- retrieval of electronically stored records,
- ensuring the retention of electronic records,
- destruction of electronic records,
- electronic record standards,
- judicial use of electronic records,
- appropriate electronic records storage medium,
- electronic records security,
- software for electronic record systems,
- equipment configuration for electronic record systems, and
- flexible disk care and handling for electronic records.⁵⁹

The magnitude of the problem is reflected in the following statement by a senior NARA official in explaining why and how the government could lose a significant portion of its institutional memory:

The impact of automation is broad ranging, Program and policy officials, sitting at their terminals, decide the fate of the information they create and receive, while in the past people trained in records management made these decisions. With the use of paper, the development of policies was simple to trace. Successive drafts indicated the evolution of decisions. With computers, though, drafts no longer exist. Instead, policy papers evolve and each new version is written over the previous one. With paper files, most people ap-

preciated the need for a coherent, centralized filing system. The increased use of automation masks this need and individuals develop personalized retrieval systems, many of which would be incomprehensible to anyone else.⁶⁰

Finally, the Acting Archivist of the United States has raised a serious concern that electronic recordkeeping may undermine aspects of the Privacy Act with respect to the currency and accuracy of Privacy Act records and their disposition. For example, electronic records may be destroyed too quickly before the record subject can, if he or she desires, check the record quality, or may be retained too long, and become stale and outdated. The Archivist believes that, while most records officers now agree that electronic records are fully subject to the Federal Records Act and other relevant public laws, many records managers need additional training and motivation—as well as guidance—in order to develop appropriate electronic records management programs.⁶¹

In sum, leading government historians and archivists believe that the United States is in danger of losing its memory, “and that historically significant first drafts of key policy documents may be lost.” Thus “[b]ecause of erasures of electronic records, future historians may know less about the 1985 arms control talks than about the 1972 Strategic Arms Limitations Talks.”⁶²

Scientific and Technical Information

Scientific and technical information (STI) collected and/or developed at Federal Government expense is an important subset of all government information. The role of information technology has aggravated some old issues and raised some new ones. On the positive side, electronic STI systems have now become a significant, if not indispensable, part of the scientific research and engineering en-

⁵⁹U.S. General Services Administration, FIRMR Bulletin 23 on “Electronic Recordkeeping,” June 18, 1985.

⁶⁰Patricia Aronsson, Director, NARA Documentation Standards Division, letter to Fred Wood of OTA, Apr. 9, 1985.

⁶¹Frank G. Burke, Acting Archivist of the United States, letter to Fred Wood of OTA, Oct. 4, 1985.

⁶²Mitch Betts, “Federal Historians Alarmed at Loss of Computerized Data,” *Computerworld*, Sept. 23, 1985, p. 34.

terprise in the United States and other technologically advanced nations. Computerized bibliographic and information retrieval systems are commonplace, as are various forms of computer networking—up to and including supercomputer networks. The use of electronic mail, electronic bulletin boards, and computer-conferencing is growing, although still at very modest levels. These technologies present further opportunities for innovation.⁶³

On the negative side, the U.S. science and engineering community appears to be so dependent on information technology to retain a competitive edge that any reductions (or even reduced growth) in this technological support are viewed with serious concern, especially in the university research community. The issues discussed earlier with respect to public information generally (e.g., greater emphasis on private sector commercial offerings and full cost recovery) may actually be even more salient in the university research community, in part because of the high percentage of Federal financial support for university research and development.⁶⁴

Commercialization of scientific and technical data is a continuing issue. A strongly held view in the scientific community is that the best research results from full and open communication and easy availability of the latest data and research findings. A good example is the debate over the Landsat Earth remote-sensing satellite program. Congress ultimately decided to transfer this program to the private sector for commercial development, over the objections of some researchers who felt that

⁶³See Jane Bortnick and Nancy Miller, *The Impact of Information Technology on Science*, Congressional Research Service, Library of Congress, July 1985, especially sections II and III; and, generally, U.S. Congress, Office of Technology Assessment, *Information Technology R&D: Critical Trends and Issues, OTA-CIT-268* (Washington, DC: U.S. Government Printing Office, February 1985). For a detailed discussion of one Federal agency's technical information activities, see U.S. Department of Energy, Office of Scientific and Technical Information, "Technical Information Management Activities: What They Are and How They Relate to and Support the DOE R&D Programs" (Oak Ridge, TN: August 1985).

⁶⁴See Bortnick and Miller, *Information Technology*, op. cit., esp. pp. 39-41, 57-60; and Patricia Battin, "Problem Trends in the Information Marketplace," *Chronicle of International Communication*, September-October 1985, pp. 5-6.

this valuable source of data might be priced out of reach if placed in a private firm.⁶⁵ This same concern has been expressed about a number of STI systems, such as the Environmental Protection Agency's transfer of its chemical information system (known as CIS) to private vendors.⁶⁶

Overall, all of the trends, issues, and opportunities discussed previously with respect to public information generally appear to apply to STI, with the further complicating factor of national security. Classified information is, of course, exempted from disclosure under FOIA and is not public information. The problem with STI is striking the appropriate balance between adequate protection for sensitive STI, on the one hand, and open and broad dissemination of STI among the research community, on the other. This involves, in part, concern about overclassification, but more importantly that unclassified STI may be restricted due to its possible use in ways that could affect national security. The tensions between open scientific exchange and tight military control of STI have heightened in recent years, in part because of information technology and the vastly increased speed, content, and complexity of electronic STI networks. Numerous professional and technical organizations have heavily resisted DOD efforts to curtail the exchange of STI. This issue is likely to continue for the foreseeable future.⁶⁷

⁶⁵*Ibid.*; U.S. National Commission on Libraries and Information Science, *Information Policy Implications of Archiving Satellite Data: To Preserve the Sense of Earth From Space*, Washington, DC, 1984; and U.S. Congress, Office of Technology Assessment, *Remote Sensing and the Private Sector: Issues for Discussion—A Technical Memorandum, OTA-TM-ISC-20* (Washington, DC: U.S. Government Printing Office, March 1984). Also see statements of witnesses at Nov. 13, 1985, hearing on "Oversight of Landsat Commercialization, held by the U.S. Senate, Committee on Commerce, Science and Transportation, Subcommittee on Science, Technology, and Space."

⁶⁶Jeffrey L. Fox, "EPA Dumps Chemical Data System" *Science*, vol. 226, November 1984, p. 816.

⁶⁷See Bortnick and Miller, *Information Technology*, op. cit., pp. 57-60; also Mitchel B. Wallerstein, "Scientific Communication and National Security in 1984," *Science*, vol. 224, May 4, 1984, pp. 460-466; Harold C. Relyea, "National Security Controls and Scientific Information," Congressional Research Service, Library of Congress, Issue Brief 82083, Sept. 11, 1981; Robert L. Park, "Restrictions on Scientific Freedom," *IEEE*

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Other Issues

OTA identified four other issues that warrant attention. These are described briefly below:

1. *Transborder information flow.* Variations in national laws and policies on information may restrict the free flow of information between nations, and curtail international market opportunities for U.S. firms. On the other hand, information technology permits a vastly expanded range of technical options for international (or transborder) information flow.⁶⁸
2. *Depository library system.* The depository library system is viewed by some as part of the public information "lifeline" or "safety net" to ensure that the public has at least one avenue of unrestricted access. Some researchers have questioned how much government information actually gets into the depository libraries, and to what extent the public is aware of and uses the libraries. Modern electronic information technologies are already important to the depository system, and are opening up many new opportunities.⁶⁹

Technology and Society Magazine, March 1985, pp. 7-9; Eric J. Lerner, "DOD Information Curbs Spread Fear and Confusion," *Aerospace*, March 1985, pp. 76-80; and "Societies Warn Defense Department of 'Counterproductive' Information Controls," *The IEEE Institute*, November 1985, pp. 1, 4.

⁶⁸See, for example, LINK Resources Corp. and Transnational Data Reporting Service, Inc., *Strategic Response to Regulation of Transnational Data Flows*, New York, 1979.

⁶⁹See U.S. Congress, Joint Committee on printing, *Provision of Federal Government Publications in Electronic Format to Depository Libraries*, report of the Ad Hoc Committee on Depository Library Access to Federal Automated Data Bases, Washington, DC, 1984; Peter Hernon, "Provision of Federal Government Publications in Electronic Format to Depository Libraries," *Government Information Quarterly*, vol. 2, No. 3, 1985, pp. 231-234; U.S. Congress, Joint Committee on Printing, *An Open Forum on the Provision of Electronic Federal Information to Repository Libraries*, Report of the Committee Staff, 99th Cong., 1st sess., June 26, 1985; and Sarah Kadec, "The U.S. Government Printing Office's Library Program's Service and Automation: An Insider's Commentary," *Government Publications Review*, vol. 12, 1985, pp. 283-288.

3. *Federal statistical system.* Federal statistical agencies are among the major Federal Government public information providers; their activities are relevant to all of the issues previously discussed. However, the statistical community has, over the last 5 years, raised questions about the proper development and coordination of Federal statistical policy, the impact of budgetary cuts and restrictions, and the appropriate role of electronic technology in the collection, maintenance, and dissemination of statistical information.⁷⁰
4. *Copyright protection.* Although copyright law prohibits the copyrighting of government information developed directly by government agencies, there continues to be concern about the status of information developed by government contractors, for example, those conducting research and development. Also, the legality and propriety of Federal agencies giving private vendors exclusive control over or rights to agency information have been questioned, as has the implicit control resulting from exclusionary pricing (e.g., pricing at a level that only trade associations, law firms, and business can afford and not most individual citizens, researchers, and public interest groups). It is not clear whether technology is part of the problem, part of the solution, or both.⁷¹

⁷⁰See U.S. General Accounting Office, *Status of the Statistical Community After Sustaining Budget Reductions*, GAO/IMTEC-84-17, July 18, 1984; U.S. Congress, House Committee on Government Operations, *The Federal Statistical System, 1980 to 1984*, 98th Cong., 2d sess., a report prepared by Baseline Data Corp. for the Congressional Research Service, November 1984; and U.S. Congress, House Committee on Government Operations, *An Update of the Status of Major Federal Statistical Agencies, Fiscal Year 1986*, 99th Cong., 1st sess., May 1985.

⁷¹For general discussion of copyright and other intellectual property issues, see OTA, *Intellectual Property Rights in an Age of Electronics and Information*, forthcoming in late 1986.