Revitalizing Information Resources Management for Electronic Delivery | 6

SUMMARY

How can the Federal Government get the highest return on the $25 billion of taxpayer money spent each year on information technology? Enactment of the Paperwork Reduction Act (PRA) in 1980 was based in part on the belief that an integrated, systematic approach to managing information technology—under the rubric of "information resources management" or IRM—would pay off in the long run. Congress amended and reauthorized the PRA for 3 years in 1986; since then efforts to further extend and update the PRA have not yet succeeded. [1]

Although the IRM concept still is sound, IRM at the Federal level has not kept up with changes in technology and the growing trend for State and local governments to use computers and telecommunications to serve their residents. The Office of Management and Budget (OMB), General Services Administration (GSA), and various individual Federal agencies have joined the "service to the citizen" movement. But the pace and creativity of Federal IRM changes are falling short of the levels needed to manage the transition to electronic service delivery.

A new IRM planning and budgeting process is needed. OTA identified seven key electronic delivery "success factors" that should be reflected in all Federal agency IRM plans and budgets:

1. grassroots involvement,
2. community infrastructure development,

FRED B. WOOD

---

[1] The Paperwork Reduction Act of 1980, Public Law 96-S1 1, was amended once by the Paperwork Reduction Reauthorization Act of 1986, Public Law 99-500. Subsequent reauthorization proposals included S. 1742, the Federal Information Resources Management Act of 1989, Oct. 6, 1989; H.R.3695, the Paperwork Reduction and Federal Information Resources Management Act of 1989, Nov. 17, 1989; S.1044, the Federal Information Resources Management Act of 1991, May 14, 1991; and S.1 139, the Paperwork Reduction Act of 1991, May 22, 1991. Proposals to reauthorize the PRA are before the 103rd Congress. See S. 681, the Paperwork Reduction Reauthorization Act of 1993, Mar, 31, 1993; S. 560, the Paperwork Reduction Act of 1993, Mar, 10, 1993; and H.R. 2995, the Paperwork Reduction Act of 1993, Aug. 6, 1993.

3. innovation (including separate funding and a clearinghouse for sharing results),

4. directories (to services and information),

5. consideration of future service delivery alternatives,

6. strategic partnering, and

7. pre-operational testing (including evaluation and policy development components).

Congress and the administration could require that these factors be adequately addressed in project-level, annual, and 5-year plans developed by the line agencies, and that some factors be funded through percentage set-asides from agency information technology budgets.

The IRM leadership and training should be strengthened and refocused. Each Federal agency needs an experienced, senior official who can bridge the gap between information technology and service delivery—whether called the senior IRM official, an assistant secretary-level Chief Information Officer, or the equivalent. The Federal IRM training program should be revamped, placing emphasis on strategic thinking, technology and policy integration, flexible planning and procurement, and customer service—along with the "success factors" noted above. Knowledgeable and committed Federal employees are essential to successful electronic delivery of services, and should be involved at every stage of electronic delivery initiatives.

Congress and the President could take the opportunities presented by electronic service delivery and PRA reauthorization to update Federal IRM, and also to rethink the Federal IRM organizational structure. OMB's Office of Information and Regulatory Affairs, GSA's Information Resources Management Service, and the National Institute of Standards and Technology's Computer Systems Laboratory, among others, could benefit from a large dose of creativity in how to best leverage scarce human, technical, and financial resources for electronic delivery. Electronic service delivery could play a key role in re-engineering the Federal Government, but significant IRM changes are a prerequisite to making this vision a reality.

INTRODUCTION

The IRM concept is relatively new (little more than a decade old) and was intended to provide an integrated approach to managing the hardware, software, personnel, services, and other components of the government's information technology activities. The IRM concept was not well defined when the Paperwork Reduction Act of 1980 was enacted, and is still very unevenly understood and accepted in government agencies. At the Federal level, the rapid advancement of information technology and its applications has made it difficult for IRM to fulfill its original promise.[2] The transition to electronic service delivery will further strain the IRM structure and staff, absent needed changes.

Information and information technology are central to the functions of a modern organization. Information technology unequivocally is evolving in the direction of multilevel, networked systems that integrate computers, telecommunications,

---

[2] See Charles R. McClure, Rolf T. Wigand, John Carlo Bertot, Mary McKenna, William E. Moen, Joe Ryan, and Stacy B. Veeder, Syracuse University School of Information Studies, "Federal Information Policy and Management for Electronic Service Delivery," contractor paper prepared for the Office of Technology Assessment, Dec. 21, 1992; U.S. General Accounting Office, *Information Management and Technology Issues,* GAO/OCG-93-5TR (Washington, DC: U.S. General Accounting Office, December 1992); U.S. General Accounting Office, *Perceived Barriers to Effective Information Resources Management: Results of GAO Panel Discussions,* GAO/IMTEC-92-67 (Washington, DC: U.S. General Accounting Office, September 1992); U.S. General Accounting Office, *Information Resources: Summary of Federal Agencies' Information Resources Management Problems,* GAO/IMTEC-92-13FS (Washington, DC: U.S. General Accounting Office, February 1992); U.S. Congress, Office of Technology Assessment, *Federal Government Information Technology: Management, Security, and Congressional Oversight,* OTA-CIT-297 (Washington, DC: U.S. Government Printing Office, February 1986); and Fred B. Wood, "Office of Technology Assessment Perspectives on Current U.S. Federal Information Issues," *Government Publications Review, vol. 17, 1990,* pp. *281-300.* For the original legislative history of the PRA, see U.S. Congress, Senate, Committee on Governmental Affairs, *Paperwork Reduction Act of 1980,* Senate Report No. %-930, Sept. 8, 1980.

and peripheral equipment with multiformat capabilities (e.g., voice, data, graphics, print, video, and optical). This trend alone argues for an integrative management approach. The new imperative for re-engineering or rethinking government inevitably will lead to viewing government services in relation to each other and to larger public goals, rather than in isolation. It also will encourage the development of common technical and organizational platforms for service delivery. These trends will, in turn, demand greater consistency and cooperation in the management of information resources. The greatest need and challenge, in this new environment, is not providing telecommunications and computer services to Federal agencies, but getting the agencies to think creatively about how information technology can best meet their needs.

Congress and the President could rethink IRM goals, planning, budgeting, training, and organization in the Federal Government, and then revise and update the PRA accordingly. The trend at the State level is to redefine IRM as a tool for achieving broader government and public objectives, rather than an end in itself. Significant changes will be needed to jump-start the Federal IRM bureaucracy to move in new directions. The Federal Government could learn from State and even local government experience in developing an innovative Federal IRM strategy. Part of the Federal strategy might include a strong emphasis on meeting citizen needs for services, grassroots community involvement, and strategic partnering—perhaps as explicit goals of Federal IRM. The Federal strategy also could adopt themes and goals that are emerging from State government efforts to improve IRM (see boxes 6-A and 6-B).[3]

NEW IRM PLANNING AND BUDGETING PROCESS

Both the Office of Management and Budget and General Services Administration have embraced the concept of electronic service delivery. OMB is on record that:

> ... the IRM community should work to build a Federal service delivery infrastructure— using information technology better to perform its missions. At root this requires new partnerships within and across agencies. Specifically, these partnerships could support: improving interagency coordination in service delivery; testing new citizen-service technologies such as kiosks; increasing the active dissemination of government information; reducing administrative burden and paperwork through the use of information technologies; and creating policies and incentive structures that encourage innovation.[4]

GSA'S fledgling "service to the citizen" program also has begun to bear fruit. Recent reports have highlighted the need for Federal agencies to become more customer-oriented, with an emphasis on the use of information technology to im-

---

[3] Many States have strategic information technology plans that encompass at least some key aspects of electronic delivery. See, for example, Information Resources Commission, State of Florida, "Annual Report on Information Resources Management Fiscal Year 1991 -92," February 1993; Information Technology Policy and Management Division, State of South Carolina Budget and Control Board, "Focus 1990s—Direct Citizen Access Using Modern Technologies—Strategic Information Technology Directions for the State of South Carol ina," Columbia, SC, May 1991; and the references cited in boxes 6-A and 6-B. Also see Sharon L. Caudle and Donald A. Marchand, *Managing Information Resources: New Directions in State Government* (Syracuse, NY: Syracuse University School of Information Studies, August 1989); Nancy Ginn Helme, New *Alliances in Innovation: A Guide to Encouraging Innovative Applications of New Communication Technology To Address State Problems* (Washington, DC: Council of Governors Policy Advisors, 1993); State Information Policy Consortium, "National Information and Service Delivery System: A Vision for Restructuring Government in the Information Age," 1992, prepared for the National Governors' Association, National Conference of State Legislatures, and Council of State Governments; Alabama Information Age Task Force, "Founding a First World Alabama: Summary," n.d.; and Eliot Levinson, "Using Information Technology Effectively in Government Organizations," *Informatization and the Public Sector, vol. 1,* 1991, pp. 143-154.

[4] Office of Management and Budget, *Information Resources Management Plan of the Federal Government* (Washington, DC: U.S. Government Printing Office, November 1992), p. HI-IO.

Box 6-A--Learning From the States: California Strategic Directions

The California State Office of Information Technology (OIT), headquartered in Sacramento, is part of the Department of Finance, and is roughly equivalent in function to the Office of Information and Regulatory Affairs (minus the regulatory side) in the U.S. Office of Management and Budget. The California OIT carries out technology advocacy, policy development and oversight, and review and approval of agency information technology budgets. The OIT has a staff of 28 persons who oversee the activities of the more than 7,000 information technology-related employees in State agencies with a combined information technology budget of about $1.2 billion.

The OIT is refining and implementing a California 2000 plan reflecting fundamental changes in the State's information technology philosophy and direction:

1. Shift *from agency automation to electronic service* delivery--During the 1980s, the challenge was to educate agencies about the basic benefits of information technology for automating the internal agency functions. Now the focus is shifting to automation of external relationships between mission agencies and their clients, customers, and citizens.

2. *Shift from implementing agency-specific automation projects to developing a common information technology infrastructure.* The old model was to identify an agency-specific problem, define the needs, and develop and apply information technology to meet those needs. The new model is to invest in generic technologies that will meet a wide range of needs, not necessarily related to a specific agency or problem, in order to develop the common infrastructure and heavy volume of use needed to realize low-cost electronic service delivery.

3. *Shift from information technology as separate from government structure to technology as an integral part of government structure.* Fiscal constraints make it imperative to restructure and re-engineer California State government. Information technology can help cut across agency and program lines and provide opportunities for integrated service delivery, at first within the existing organizational structure but eventually leading to a re-engineered, streamlined structure. The hope is that information technology changes will lead naturally to organizational changes, with a lesser degree of political and personnel trauma than usually accompanies structural change. Information technology should result, over a few years time, in fewer mid-level managers, fewer computer programmers, more applications specialists and strategic thinkers, and a decentralized, democratized information technology infrastructure.

4. *Shift from information technology or automated data-processing staff as relatively narrow technical specialists to mom innovative, broadly gauged application generalists.* Career paths need to be based not just on the size and complexity of technology managed, but on the impact and leverage of the technology to improve service delivery and government functioning.

Specific OIT initiatives include:

1. requiring agencies to have an explicit information technology strategic infrastructure plan, against which OIT will evaluate specific agency proposals;

2. providing training to help agency information technology staff gain new, broader perspectives, including a Data Processing Academy (about 4 to 5 weeks total class time spread over 1 year) and Executive Institute (a few days in duration);

3. supporting an advanced technology program that permits agencies to develop and test technologies outside of the normal procurement process;

4. supporting InfoCal as a kiosk-based component of the State information technology infrastructure; and

5. supporting the State Department of Motor Vehicles magnetic stripe card as a service delivery and identification card.

SOURCE: Based on OTA Interviews with senior California State officials. For further discussion, see State of California, Department of Finance, Office of information Technology, *Managing Information In California State Government An Executive Perspective,* Sacramento, CA, December 1991, and Office *of Information Technology . . . Putting Information To Work Programs and Organization,* **Sacramento, CA, March 1992.**

Box 6-B—Learning From the States: Washington State Strategic Directions

The State of Washington has an aggressive strategy to harness information technology to change and improve State government. The State government leadership believes that information technology is a key resource that can be used to increase government productivity and improve service delivery. However, information technology is not an end in itself; it is a resource to be used to accomplish broader government objectives.

The State Office of Financial Management (equivalent in part to the Federal OMB) chairs an interagency subcabinet (Deputy Director level) group that meets about twice a month; the State Department of Information Services is responsible for policy development and implementation. Key statewide information technology issues and initiatives include:

1. use of the State government's personal computer infrastructure-the 50,000 installed personal computers (for 85,000 employees) offer substantial opportunities for local and wide-area network interconnectivity, electronic mail, document transfer, and the like;

2. the paperless government-how can the State government take advantage of the telecommunications and computer infrastructure to drastically reduce government paperwork;

3. citizen access to government-the State is looking at the full range of options, from kiosks to bulletin boards to videoconferencing, to improve access, reduce citizen trips to agencies, etc.;

4. horizontal services integration-how can information technology be used to combine service delivery across agency boundaries, such as consolidated business reporting forms and a master business license (that combines previously disparate licensing documents), or consolidated State information dissemination; and

5. capacity building-the intent is to use continuing education and training to help senior managers better understand the vital role of information technology and resources in transforming State government.

Leadership is key to the State of Washington's success. State information resources management must strike the right balance between providing centralized guidance and principles while encouraging innovation and allowing enough room for individual agency/program variability. The State is emphasizing the need for:

1. multiple focal points of expertise (e.g., agency IRM offices, statewide IRM support offices);

2. more public-private (e.g., with private firms) and public-public partnerships (e.g., using distance education facilities for State agency hearings, working with Federal agency counterparts); and

3. leveraging opportunities for economies of scale (e.g., creating single points of presence where State and Federal services would be available over the same terminal facilities).

SOURCE: Based on OTA interviews with senior Washington State officials. For further discussion, see Washington State Department of Information Services, /formation *Technology in Washington State Government: A Biennial Report,* Olympia, WA, June 1992; New*Directions in Information Resources Management: Information Technology Act of 1992,* Olympia, WA, June 1992; and/*reproving the Management of Information Systems in Washington State: A Report to the Legislature,* Olympia, WA, Jan. 15, 1992.

---

prove the quality, accessibility y, and cost effectiveness of service to citizens, [5]

Current OMB planning guidance, issued pursuant to the PRA, is moving agencies in the direction of thinking more strategically about their use of information technology. OMB asks agencies to supply information on "service to the citizen" projects, including:[6]

---

[5] See U.S. General Services Administration, Information Resources Management Service, *Service to the Citizens: Project Report,* KAP-93- 1 (Washington, DC: U.S. General Services Administration, February 1993); Jerry Mechling, Jane E. Fountain, Linda Kaboolian, and Steven Kelman, *Customer Service Excellence: Using Information Technology to Improve Service Delivery in Government* (Cambridge, MA: Harvard University John F. Kennedy School of Government, Program on Strategic Computing and Telecommunications in the Public Sector, June 1993), prepared with financial support from GSA and several other Federal agencies; and Vice President Al Gore, *Creating a Government That Works Better and Costs Less; Report of the National Performance Review* (Washington, DC: U.S. Government Printing Office, Sept. 7, 1993),

[6] Office of Management and Budget, "Information Resources Management Plans Bullet in," OMB Bulletin 93- I 2, Apr. 28, 1993.

- impetus for the project;
- how the project works;
- level of citizen effort required to participate;
- phase of the project life cycle;
- agency coordination;
- legal, regulatory, or technical impediments;
- project evaluation (planned or completed); and
- project benefits.

OMB intends to use this information to create an inventory of projects and identify needed policy changes, and as input to next year's governmentwide information resources management plan.[7] And OMB further acknowledged the role of electronic delivery in its recently revised information resources management circular.[8]

The results of these OMB and GSA initiatives, while likely to be useful, fall short of adequately focusing agency attention and resources on keys to successful electronic delivery.

In addition to grassroots citizen involvement and strategic partnering, ingredients of successful electronic service delivery projects are likely to include: *vision*—a clear idea of where the project is going and what needs or goals are to be met; *innovation--creative* application of technology and/or rethinking of how services can be delivered; and *pre-operational testing—an* opportunity to checkout the design concept before committing to large-scale development and deployment, including explicit evaluation and policy development components. Many Federal and State/local government agencies, as well as private sector organizations, have learned through experience that the absence of one or more of these elements can spell trouble.[9]

The challenge is building vision, innovation, and pre-operational testing, as well as grassroots involvement and partnering, into the overall planning and budgeting process-without simply adding more layers of bureaucratic procedures and red tape. Congress and the administration could require that the annual and 5-year information technology plans currently prepared by Federal agencies explicitly address these and other key elements,[10] but give the agencies considerable discretion about how to carry out this requirement. Agency planning has matured considerably since enactment of the PRA in 1980, but still leaves room for improvement as a forward-looking, creative process. Congress could further amend the PRA to provide more direct guidance on agency planning and budgeting for electronic delivery. OMB could revise its various bulletins and circulars to do likewise, as could GSA with regard to its Federal IRM regulations and manuals.

Fostering a clear vision is partly a function of a government leadership that encourages creative thinking about using information technology to help improve service delivery. Vision is also strengthened by hiring and training in-house futurists and entrepreneurs who will push agencies to fresh insights; by organizing workshops, retreats, and seminars for agency staff and outside innovators to think openly about re-engineering agency functions; and by providing incentives and rewards for those who produce insightful, useful applications of electronic service delivery. OMB is taking initial steps in this direction by requiring linkages between agency strategic goals and the use of information technology to improve service delivery,[11] but, at this point, the OMB guidance is not sufficiently refined or focused. OMB could redirect existing advisory mechanisms, or create new ones, to generate more creative ideas on electronic delivery both from within and outside the

---

[7] Issued annually by OMB.

[8] Office of Management and Budget, OMB Circular A-130 Revised, "Management of Federal Information Resources," *Federal Register, vol. 58, No.* 126, July 2, 1993, pp. 36068-36086; see sec. 7(l): "Modern information technology presents opportunities to improve the management of government programs to provide better service to the public . . . "

[9] See U.S. Congress, Office of Technology Assessment, "Montana/Wyoming Trip Report," "Alaska Trip Report," "California Trip Report," Nov. 10, 1992; Caudle and Marchand, *Managing Information Resources,* op. cit., footnote 3.

[10] See key information and Communication policy concerns discussed in ch. 7.

[11] See OMB Bulletin 93-12, op. cit., footnote 6.

The State of California's Franchise Tax Board has invested heavily in automated voice response technologies to provide faster, more accurate answers to inquiries from California taxpayers.

Federal Government.[12] Advisory groups should be encouraged to use electronic technology, such as computer and videoconferencing, to facilitate their work.

Some States and private companies have experimented with innovation funds—i.e., a small amount of risk money (not so small for some companies) set aside for innovative projects and applications where success is not guaranteed. Private companies have learned to invest in multiple projects and approaches, knowing that not all will succeed but that the greater failure is not to try. Taking risks is harder to politically justify when taxpayer dollars are involved. But in the long run, the public is likely to be well served by encourag-

ing agency innovation in electronic service delivery. Congress and the administration could encourage or mandate that a percentage of every agency's information technology budget be reserved for small-scale innovation, Just one-half of 1 percent would create a governmentwide electronic delivery innovation fund of about $125 million.

An innovation fund (or separate agency funds) could and probably should be disconnected from operational or pre-operational electronic delivery programs in order to avoid competition for funds and excessive red tape, Once a specific electronic delivery application reaches the pre-operational stage, then more explicit and rigorous guidelines usually are needed.

Deciding on specific technical systems for service delivery will still be complicated because, as yet, most options have been tested on a relatively small-scale basis and without the benefit of fully competitive technology development. Numerous Federal, State, and local-level pilot tests or limited operational deployments of kiosks, dial-up computer access, and smart cards demonstrate that these technologies can work for electronic service delivery. But there are many unanswered questions about scaling up to regional or nationwide applications that are fully operational and cover multiple programs.[13]

Indeed, it is premature to make detailed technical and operational decisions on large-scale nationwide electronic delivery systems. Congress and the administration could, however, authorize a coordinated, governmentwide, scaled-up pre-

---

[12] OMB could begin by taking an inventory of existing advisory bodies, starting with its own Federal IRM Council (.Senior agency IRM officials), and including various official and ad hoc interagency advisory and coordinating committees. OMB could review the experience and suggestions of outside advisory groups, including the Center for Information Management operated by the National Academy of Public Administration, the National Institute of Standards and Technology's Computer Systems Security and Privacy Advisory Board, the National Research Council's Computer Science and Telecommunications Board, and the Project Advisory Panels for this and other related Office of Technology Assessment studies. OTA'S experience has been that outside advisory groups-properly selected, prepared, and chaired—can be quite helpful. **For an example oft** ypical **advisory input, see Center for Information Management, National Academy of Public** Administration, "The Information Government: National Agenda for Improving Government Through Information Technology," recommendations from a forum of senior government and private sector officials held Apr. 23-24,1993, and submitted July 15, 1993, to Vice President Gore and the National Performance Review,

[13] EBT has been the most extensively pilot-tested and evaluated electronic delivery alternative; yet **even here, many** questions remain when moving up to a nationwide scope of operations, See ch. 4 for further discussion.

operational testing program designed to mix and match different technical delivery alternatives, Federal services, and agency partners. Such a program could be funded by reprogramming existing monies. An effective testing program would need top-level support from OMB and the Office of Science and Technology Policy (OSTP), among others, and involvement of some kind of interagency committee to assure agency cooperation.

The testing program would, ideally, preserve ample opportunity for creativity and innovation while looking for opportunities to realize economies of scale and scope. For completeness, the testing program would include: 1) a competitive technology development program (to ensure that the government has the benefit of state-of-the-art technical approaches); 2) an evaluation component (so that the testing results will provide the information needed for decisionmaking); and 3) a policy analysis component (to anticipate policy issues that would need resolution prior to full-scale operational deployment—also see ch. 7 issues discussion). The testing program could begin to show results in a 12- to 18-month timeframe, and perhaps as soon as 6 months for technical applications that have already been well tested.

To get the maximum return on current and new investments in electronic delivery innovation and testing, agencies should share results among themselves and their State/local counterparts. Current] y this is a hit or miss process. OTA found that many Federal agency information technology officials are only vaguely aware of what other Federal or State/local agencies are doing with electronic delivery, let alone knowing the results of these efforts. State/local government awareness is, likewise, generally quite limited. The trade and specialty press play a helpful role in sharing results, as do professional associations and confer-

ences focused on government information technology. Federal interagency working groups have proven effective at sharing experience in specific application areas. And some universities have information management or public administration programs that attempt to track Federal and State/local electronic delivery projects. All of these efforts are worthwhile, but leave many gaps in coverage and, more importantly, still fail to reach numerous Federal and State/local information technology personnel.

Congress and the administration could, as part of a broader electronic service delivery innovation initiative, encourage more effective sharing of innovations by:

1. asking one or more appropriate Federal agencies[14] to establish or coordinate, directly or under contract, a clearinghouse for information on electronic delivery innovations and results that is accessible and disseminated to the public electronically (this could include the results of OMB's survey of agency "service to the citizen" projects); [15]

2. requiring electronic service innovators in Federal agencies to provide input to the clearinghouse (reporting on results should be included in all project budgets);

3. encouraging State/local and private sector innovators to provide input to the clearinghouse;

4. asking the National Technical Information Service (NTIS) and Government Printing Office (GPO) to collaborate on how they might provide special directories or bibliographic indices to federally funded electronic delivery projects; and/or

5. providing funding through a designated Federal agency[16] to qualified universities or private sector researchers to conduct periodic

---

[14] Candidates might include the General Services Administration, National Institute of Standards and Technology, National Technical Information Service, Government Printing Office, and U.S. Geological Survey, among others.

[15] OMB is not at present well situated or staffed to operate a clearinghouse or directory. OMB's troubled efforts to implement the Federal Information Locator System are instructive,

[16] Such as GSA, NIST, and/or the National Science Foundation.

surveys and syntheses of electronic service delivery projects.[17]

In each of the above, information technology, such as electronic bulletin boards and computer networking, can be used to facilitate exchange of information about innovations. An innovation clearinghouse also should be viewed more broadly as part of the Federal Information Locator System (FILS) concept, mandated by the PRA but as yet not fully implemented. A directory (or family of directories) to Federal services and information, whether called FILS or something else, is essential to effective electronic delivery.[18] Federal directories now can be structured by using wide-area search and retrieval technologies that allow individual agency directories to function collectively as a "virtual" governmentwide directory (see ch. 7 discussion).[19]

An IRM planning and budgeting process re-oriented to electronic delivery needs to integrate all key success factors: grassroots citizen involvement; community infrastructure; innovation; directories; visioning; strategic partnering; and pre-operational testing (with evaluation and policy development components). Collective] y, these would constitute the backbone of a governmentwide electronic service delivery initiative. Congress and the administration could provide agencies with guidance or directives on each of the success factors. One possible approach is illustrated in table 6-1. The amount of funds set aside for grassroots involvement, community infrastructure development, and innovation would

need to be evaluated periodically; the percentages shown in table 6-1 represent OTA's best judgment of the amount required to make a significant difference.

∎ Strengthened IRM Leadership

Experience indicates that IRM works only if the top-level decisionmakers understand the role of IRM and information technology, and include IRM in the decisionmaking process. In the Federal Government, each agency is required to designate a senior IRM official—typically an assistant or deputy assistant secretary for administration, or equivalent. If information technology and electronic delivery are to be key components of a re-engineered government, then these positions need to be revised as well.

Senior IRM officials provide some high-level visibility for IRM and information technology, but typically have major administrative responsibilities beyond IRM. The senior IRM officials frequently delegate many IRM responsibilities to lower level staff. The problem is compounded if the senior designated official is not "in the loop" on major agency programmatic decisions. Agencies could be required to have a senior official at the level of assistant secretary or assistant bureau chief with full-time IRM responsibilities, and to include that person in top-level planning and decisionmaking on agency programs and service delivery strategies. In private industry, this official is frequently known as the "chief information officer" or CIO and also may serve as a corporate vice president and member of the executive com-

1? OTA has funded ad hoc surveys, in the absence of a continuous, sustained survey program funded by the executive branch. For OTA survey results, see, for example, John Harris, Alan F. Westin, and Anne L. Finger, "Innovations for Federal Service: A Study of Innovative Technologies for Federal Government Services to Older Americans and Consumers," contractor report prepared for the Office of Technology Assessment, February 1993; Richard Civille, "Broadening the Research Community: Delivering Federal Services Using Information Technology," contractor report prepared for the Office of Technology Assessment, December 1992; Susan G. Had&n and W. James Hadden, Jr., "Government Electronic Services and the Environment," contractor report prepared for the Office of Technology Assessment, November 1992; William H. Dutton and K. Kendall Guthrie, "State and Local Government Innovations in Electronic Services: The Case in the Western and Northeastern United States," contractor report prepared for the Office of Technology Assessment, Dec. 12, 1991.

18 Also see Gary D. Bass and David Plocher, "Finding Government Information: The Federal Information Locator System (FILS)," Government Information Quarterly, vol. 8, No. 1, 1991, pp. 11-32.

19 Wide Area Information Servers and Gopher software are two examples of new ways to effectively and quickly search and retrieve information from geographically remote directories, Gopher is capable of finding and accessing databases at participating locations within a second or two anywhere in the United States, and within a few seconds globally (assuming available telecommunication lines and proper technical setup at both ends).

Table 6-1—illustrative Guidance to Federal Agencies on Electronic Service Delivery

Success factor	Possible congressional or Office of Management and Budget guidance
Grassroots citizen involvement	Required component of all electronic delivery project plans, 0.25% minimum set-aside from agency information technology (IT) budget
Community infrastructure development	optional component of project plans; but 0,25% minimum set-aside from agencywide IT budget allocated to infrastructure development
Encouraging innovation	Required agencywide program; 0.5% minimum set-aside from agency IT budget; required participation in innovation clearinghouse
Creating directories	Required; each agency to plan and implement directory (or directories) to agency services and information; required participation in governmentwide directory
Creating alternative futures	Required component of agency annual and 5-year Information Resource Management (IRM) plans
Strategic partnering	Required component of agency annual and 5-year IRM plans; optional component of project plans, but must be considered
Pre-operational (pre-op) testing:	Prerequisite for all medium- to large-scale regional or nationwide electronic delivery systems
Pre-op evaluation	Required component of pre-op testing plans: 5% minimum set-aside from pre-op testing budget
Policy development	Required component; 5% minimum set-aside from pre-op budget

SOURCE Office of Technology Assessment, 1993.

mittee. This reflects the dominant corporate view of information technology as a strategic resource. The private sector experience has demonstrated, however, that an effective CIO has strong working relationships with the persons responsible for product development and sales—the "bottom line" activities equivalent to program or service delivery in the government context. Otherwise, the CIO will not be effective.

The Department of Veterans Affairs (VA) has established, in part at the urging of Congress, an intra-agency Council of Chief IRM Officers drawn from the various major VA bureaus. This concept could be replicated at other cabinet departments. Some proposals for elevating the Environmental Protection Agency (EPA) to cabinet status include an assistant secretary-level CIO. Congress could amend the PRA to require that all departments, or perhaps all agencies, have CIOs and that all cabinet departments have "Councils of CIOs or Chief IRM Officers." For the CIO concept to work, each CIO must have the authority and responsibility (and the requisite qualifications and experience) to bridge the all-too-frequent gap between the world of information technology and the world of service delivery. The results of OTA research and site visits, and extensive State/local government experience and academic studies, are clear: successful electronic service delivery requires leadership from persons who understand the technology being applied, the programs being delivered, and the customers or clients.[20]

20 See John Leslie King and Kenneth L. Kraemer, "patterns of Success in Municipal Information Systems: Lessons From U.S. Experience," *Informatization and the Public Sector,* vol. 1, 1991, pp. 21 -39; and James L. Perry, Kenneth L. Kraemer, John Leslie King, and Deborah Dunkle, "The Institutionalization of Computing in Complex Organizations," *Informatization and the Public Sector,* vol. 2, 1992, pp. 47-73.

The Federal Government also needs a new IRM training program. State/local and private sector experience with electronic delivery points to the need for a revamped training program as part of successful electronic delivery. Training has come a long way from the days when IRM staff were, quite accurately, equated with automatic data-processing personnel. Only a decade ago, few in-house or outside IRM training programs existed, Now the GSA, U.S. Department of Agriculture (USDA) Graduate School, and numerous academic and commercial education programs offer IRM-related courses. The GSA's "Trail Boss" program to train agency procurement staff and "1,000 by 2000" program to train 1,000 IRM staff by the year 2000 are commendable in spirit. But electronic service delivery is not yet a central focus, and these training programs would need considerable revision to support a new Federal IRM strategy. A conventional IRM approach will no longer suffice.

The Federal IRM leadership could collaborate with its State/local counterparts and academic experts on the development of new training materials and courses. The State of California, for example, has initiated a multi year plan to retrain and re-educate many of its 7,000 IRM employees, with the objective of redirecting t he IRM bureaucracy y from an internal to an external electronic service-oriented mission. The training challenge facing the Federal Government is about an order of magnitude greater. Roughly 70,000 Federal employees have primarily computer or communications responsibilities; the total approaches 100,000 if librarians, audio-visual and public affairs specialists, archivists, technical writers, printers, and the like are included. Many of these jobs are going to change in content and responsibilities as the government moves further into electronic delivery activities. Good training can help make the transition as painless and stress-free as possible, and can help improve both productivity and cooperation in IRM operations.

Concepts that warrant emphasis in IRM training programs include:

1. assessing customer or client needs,
2. integrating customer perspectives and needs into electronic service delivery planning from the outset,
3. developing electronic delivery scenarios,
4. revising agency automation and information technology programs to support electronic service delivery,
5. designing electronic service as part of integrated (intra- and interagency) delivery strategies, and
6. managing electronic delivery projects under conditions of rapidly changing technologies and needs.

Information technology managers in the government, as in the private sector, must learn more flexible, adaptable methods to keep projects on track in the face of rapid change. And the training process itself needs to be flexible with use of a wide range of techniques—including small-group seminars, off-site technical training, customer awareness or sensitivity training, hands-on demonstrations, personal computer-based interactive training, distance learning, and training videos.[21]

A new training program is one way to involve the affected Federal labor force in planning and implementation of electronic delivery. Even with the best laid plans and adequate funding, Federal employees will make or break the success of electronic delivery. Knowledgeable and committed employees are essential. The history of government and corporate automation is replete with failures due in part to poorly trained, uninvolved, and sometimes even alienated or hostile employees. OTA commissioned, for example, a case study on integrating information technology and

21 For discussion of local government trainin experiences, see Patricia T. Fletcher, Stuart 1. Bretschneider, and Donald A. Marchand, *Managing Information Technology: Transforming County Government* (Syracuse, NY: Syracuse University School of Information Studies, August 1992).

PHOTOS: FRED B. WOOD
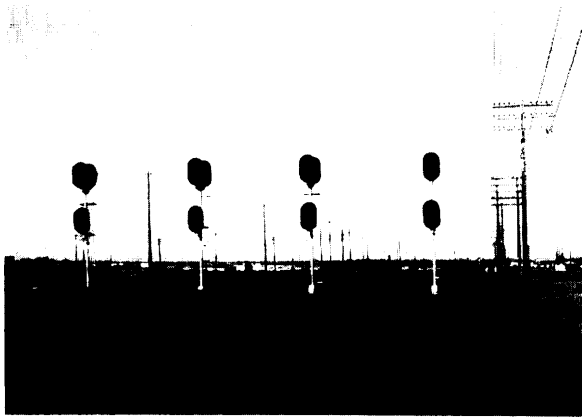
Top: Automated railroad signaling system, Union Pacific Station, Billings, Montana. Modern telecommunication systems are vital to the safe and efficient operation of the Nation railroads.

Right: *Microwave relay station in Billings, Montana. The Nation telecommunications and information infrastructure will be as important to 21st century America as the railroads and highways in the 20th century.*
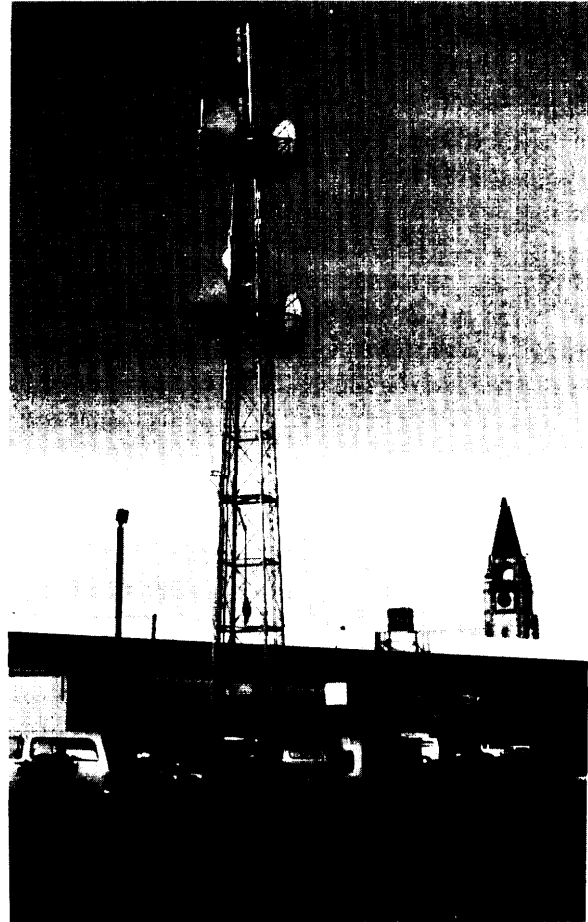
service delivery at the Social Security Administration. This review of one of the largest and oldest Federal agency automation programs concluded that impacts on the agency labor force must be addressed from the outset; labor must be included as a full partner at all stages of agency automation. Neglect or deferral of labor implications and concerns-especially about job changes or losses—easily can result in much greater costs and problems over the longer term.[22] This will be no less true for electronic service delivery initiatives.

REFOCUSED IRM ORGANIZATION

Congress and the President could use the opportunities presented by electronic service delivery to rethink and possibly reorganize the Federal IRM organization. At present, the executive branch

IRM leadership is shared, per the PRA, among the OMB's Office of Information and Regulatory Affairs (OIRA), GSA's Information Resources Management Service (IRMS), and the National Institute of Standards and Technology's (NIST's) National Computer Systems Laboratory (CSL). Other Federal agencies, while outside the formal IRM umbrella, are or could become key policy players in electronic delivery of Federal services. These include the National Telecommunications and Information Administration (NTIA) and the

---

22 Harris, Westin, and Finger, *Innovations for Federal Service,* op. cit., footnote 17. Also see U.S. Congress, Office of Technology Assessment, *Automation of America's Offices,* OTA-CIT-287 (Washington, DC: U.S. Government Printing Office, December 1985); U.S. Congress, Office of Technology Assessment, *The Social Security Administration and Information Technology,* OTA-CIT-311 (Washington, DC: U.S. Government Printing Office, October 1986); and Diana Roose, *High Performance Office Work: Improving Jobs and Productivity* (Cleveland, OH: 9 to 5 Working Women Educational Fund, 1992). Also, OTA has initiated a review of the Social Security Administration's current automation program, at the request of the House Committee on Appropriations; OTA is examining the implications of automation for customer satisfaction, service delivery, and labor force involvement and productivity, among other topics.

White House Office of Science and Technology Policy (OSTP).

OIRA is the lead information policy and budget office for the executive branch; OIRA also has responsibility for reviewing agency information collection requirements, including those associated with proposed regulations. Some IRM experts believe OIRA allocates too many staff to budget and regulatory review at the expense of information policy. Consumer, environmental, and public interest advocates believe OIRA overstepped its mandate when conducting substantive review of agency regulatory proposals, well beyond the information collection implications, and violated due process and open government requirements in doing so. OIRA has, in the past, argued:

1. that its staff gains additional clout by combining the policy analyst and budget examiner roles, which promotes stronger information policy;

2. that the substantive and information requirements of regulatory proposals are frequently inextricably related;

3. that, in any event, OIRA has the authority to conduct substantive regulatory reviews on behalf of the President—whether authorized by the PRA or not; and

4. that such reviews are subject to executive privilege.

The prior administration transferred the more controversial OIRA regulatory activities to a then newly created Council on Competitiveness reporting to the Vice President. The current administration terminated the Council on January 20, 1993.

When reauthorizing the PRA, Congress could clarify OIRA's role regarding substantive regulatory review, and the need for adherence to principles of open government to the maximum extent possible, Congress could further focus OIRA by statutorily defining and limiting substantive regulatory review, possibly even dropping the "R" from OIRA. Congress could refocus the "new" OIRA on information policy, management, and

budgetary matters, and more broadly on electronic service delivery initiatives.

Also, Congress could redefine the OIRA role in approving agency information collection requirements to emphasize fundamental reform in agency practices, using electronic delivery to drastically reduce bureaucratic red tape and paperwork, improve productivity, and increase customer satisfaction. The objective could be to orient OIRA much more towards creative, innovative use of electronic technology to meet traditional and new goals. Setting up an "Electronic Service Delivery" branch within OIRA might help. OIRA has not had sufficient staffing and resources to adequately do its information policy job, let alone address electronic delivery, partly because attention has been diverted to regulatory activities and resultant political issues.

GSA's IRMS provides detailed management support and guidance to the agency IRM activities, including assistance with agency planning, management, training, and procurement of computer and telecommunications technologies and systems (including administration of FTS2000). GSA/IRMS issues the delegations of authority for agency procurement and numerous regulations and guidelines on agency IRM activities. GSA/IRMS has sponsored some small electronic service delivery initiatives (e.g., the "Service to the Citizen" program, and the Center for Information Management at the National Academy of Public Administration), but in general has found it difficult to take a leadership role on electronic delivery—even though some GSA/IRMS officials recognize the potential.

The organization and role of GSA in information technology—and, potentially, electronic service delivery—warrant congressional and executive branch review. GSA/IRMS could be split from the rest of GSA (that which deals primarily with the acquisition and management of Federal buildings and supplies) and set up as a separate "Information Resources Agency" or "Electronic Services Agency," or possibly combined with some other existing agency. This might give the

IRM function more visibility and leverage. Alternatively, a new "Assistant Commissioner for Electronic Delivery" or some other high-level organizational unit focused on electronic delivery could be established within IRMS. But whatever the organizational locale, a rethinking of GSA/ IRMS is in order. GSA/IRMS needs to create a new vision of its role in electronic service delivery, and critically review its priorities and resource allocation against that vision. Staff may need to shift their focus from what many agency IRM staff believe is an excessive involvement with the minutia of IRM to greater attention to strategic thinking, visioning, planning, and training for electronic service delivery.

The GSA/IRMS field structure around the Nation is a potentially valuable asset for Federal/ State/local information-sharing and collaboration on electronic service delivery. But the field structure needs to be re-energized—and probably reorganized and retrained—both to work with the Washington headquarters around a common vision, and to reach out more effectively to State/ local government and private sector electronic delivery innovators and activists. Each GSA/ IRMS regional and State office could be required to have an electronic service delivery coordinator.

A revitalized OMB/OIRA and GSA/IRMS could, in addition to current responsibilities, take more aggressive action on:

- *Intelligent buildings—by* adopting "smart office" or "intelligent office" prototypes that support a wide range of computer and telecommunications applications, including electronic delivery, without having to endlessly rewire at substantial cost;
- *Telecommuting—by* building on current "flexiplace" and "telework" programs that are demonstrating the energy, environmental, and quality of work and family life benefits when carefully planned and implemented;
- *Energy efficient electronic delivery-by* building on current efforts to reduce the energy consumption of computers, peripheral equipment, and networks used by the Federal Government;

- *Electronic commerce—by* extending the Department of Commerce's "Electronic Commerce 2000" program--designed to automate all business transactions (filings, billings, applications, data reporting, etc.) with the department by the year 2000-to all Federal departments and agencies with the goal of drastically reducing paperwork;
- *Electronic government--by extending OMB's* recent requirement that agencies use electronic mail for exchange of internal memos, documents, drafts, testimony, and the like to all internal government information, using appropriate technology and making provision for full compliance with open government, public access, and record archiving requirements (see ch. 7); and
- *Re-engineering government-by* developing "InfoFED," "FedServe," "Federal Buddy," and other prototypes based on agency efforts to fundamentally rethink how they deliver services, such as the USDA's "Easy Access" and "InfoShare" programs to deliver multiagency services over a common set of technology platforms or points of access (kiosks, smart cards, computer networks, Cooperative Extension Service offices, etc.) (see table 6-2 for other examples).

NIST also has a significant role in governmentwide IRM leadership, and potentially in electronic service delivery. The NIST Computer Systems Laboratory (CSL) is responsible for: 1) policy development and oversight of computer and communications security in the civilian agencies; 2) promulgation of technical standards on a wide range of information technology and systems used by Federal agencies (as part of public-private standards-setting processes); and 3) management of technology laboratories, demonstrations, and conferences related to Federal information systems.

NIST/CSL could establish a new "electronic service delivery laboratory" that focuses on technology and standards development relevant to electronic delivery. A new NIST "electronic de-

PHOTOS: FRED B. WOOD

Top: The Telecommuting Work Center in Riverside, California, provides employees from participating organizations with complete office facilities, including telephone, facsimile, computer, and duplication services.

Bottom: *The Telecommuting Work Center is intended to significantly reduce the time, money, congestion, and pollution associated with the long commute distances typical of Southern California.*

livery lab" could be colocated with GSA/IRMS or with a newly established "Information Resources or Electronic Delivery Agency." This would improve integration of policy, management, and technical perspectives, but, on the other hand, would remove the lab from the otherwise compatible standards and technology environment at the main NIST facility in Gaithersburg, Maryland. Alternatively, NIST could setup the lab in Gaithersburg, but also operate a satellite mini-lab at the downtown GSA building (or at the Department of Commerce headquarters building), readily accessible to staff from OMB/OIRA, GSA/IRMS, and other agencies. This could be supplemented by computer conferencing and videoconferencing between Gaithersburg and Washington, DC.

OSTP has statutory responsibilities for scientific and technical information dissemination, unaddressed until recently,[23] and in the last few years has provided coordination for the Federal high-performance computing and net working initiative. OSTP has a lead role in carrying out the President's technology policy. The policy gives high priority to development of the national information infrastructure for economic stimulus, jobs creation, education and training, international competitiveness, science and engineering leadership, and a more productive and responsive government. Thus OSTP has a logical role in governmentwide electronic delivery initiatives, both because the information infrastructure is a primary vehicle for Federal electronic delivery across the board, and because the Federal science and technology agencies will be heavily involved in electronic delivery of their own services.

NTIA, located in the Department of Commerce as is NIST/CSL, has statutory responsibilities for

---

[23] Prior to this administration, OSTP has been remiss in carrying out its statutory responsibilities for scientific and technical information. See U.S. Congress, Office of Technology Assessment, *Helping America Compete: The Role of Federal Scientific and Technical Information,* OTA-CIT-454 (Washington, DC: U.S. Government Printing Office, July 1990); and Fred B. Wood, "Helping America Compete Through More Effective Use of Scientific and Technical Information: An Opportunity for Office of Science and Technology Policy Leadership," *Government Information Quarterly,* vol. 8, No. 1, 1991, pp. 105–1 12. H.R. 1757, the National Information Infrastructure Act of 1993, approved by the House on July 20, 1993, and S. 2 Title VI, the Information Technology Applications Act of 1993, reported out of committee on May 25, 1993, would strengthen and broaden the OSTP role in electronic delivery of educational, health care, library, and information services over computer networks. Also see Information Infrastructure Task Force, "The National Information Infrastructure: Agenda for Action," National Telecommunications and Information Administration, Washington, DC, Sept. 15, 1993.

Table 6-2—Illustrative Prototypes of Re-Engineering Government
Through Information Technology

Federal agency	Prototype applications
Department of Veterans Affairs	Plans to use electronic data interchange (EDI) for processing client histories, purchase orders, claims and payments for health care providers and insurers, mortgage applications for lenders, etc.; expected to cut processing costs in half
Department of Agriculture (USDA)	Plans one-stop electronic shopping for services from multiple USDA agencies, e.g., Rural Development Administration, Soil Conservation Service, Farmers Home Administration, Extension Service
Internal Revenue Service	Plans all-out push for widespread electronic filing to reduce paperwork, errors, and cost through telephone filing (touchtone plus voice or identifier recognition), PC filing, joint Federal/State electronic filing, and third-party filing
Securities and Exchange Commission	Under pressure to provide computer network (including Internet) access to EDGAR, a public database of corporate financial and business information
Environmental Protection Agency (with U.S. Army)	Provides on-line computer access to the EnviroText database of Federal/State environmental laws and regulations
Environmental Protection Agency	Plans extensive use of EDI for monitoring hazardous waste shipments, water discharges, and smokestack emissions
Census Bureau	Plans use of pen computers, by year *2000,* for census-takers
Food and Drug Administration	Could include filing by computer as well as by mail. fax, or phone for physician reporting of drug and medical device side-effects to the MEDwatch database
Department of Housing and Urban Development	Plans extensive use of EDI for processing mortgage Insurance claims from over 13,000 lenders
Food and Nutrition Service	Plans nationwide implementation of magnetic stripe card for Issuing food stamp benefits
White House Health Care Reform Task Force	Plans to recommend nationwide implementation of a "Health Passport" card as part of the health care reform package

SOURCE: Office of Technology Assessment, 1993,

technical and policy analyses on Federal spectrum management, national information and telecommunications issues, government communications, and a public telecommunications grant program. NTIA was created in 1978 by combining most of the former White House Office of Telecommunications Policy with the Commerce Department's pre-existing Office of Telecommunications. With few exceptions, NTIA has focused primarily on telecommunications policy and has done little on

national information policy.[24] This will change, however, since NTIA is to administer information networking pilot projects (matching grants to States, schools, and libraries) called for in the President's technology policy, and is participating in national information infrastructure activities. The networking pilot projects certainly could involve electronic delivery of services, and NTIA's general charter would suggest a broader role in electronic service de] i very initiatives.

Strengthening the "I" in NTIA would require top-level management support (both within the Department of Commerce and at the White House), increased resources (perhaps in part through reallocation of existing NTIA funds and staff), strong NTIA leadership on the importance of information policy, and probably some degree of organizational and staff changes or restructuring within NTIA.

In sum, there is a need to rethink traditional IRM and the relationships between IRM, elec-

tronic service delivery, and the national information infrastructure. This could include a review of how the traditional IRM organizations at OMB, GSA, and NIST--and their counterparts in the mission agencies-can work better together and with others, like OSTP and NTIA. The review could extend to other Federal agencies that have a role in electronic service delivery, such as the National Archives and Records Administration, Consumer Information Center, and Depository Library Program (see ch. 7). The Office of the Vice President could provide a focal point for rethinking IRM, since information technology and electronic service delivery are central to both the administration's "National Information Infrastructure" (NH) and "National Performance Review" (NPR) initiatives. Electronic service delivery is also germane to various proposals for outside study commissions on reinventing or rethinking the Federal Government's organization for the 21st century.[25]

---

[24] The two major NTIA analytical contributions over the last decade were *NTIA Telecom 2000: Creating the Course for a New Century,* NTIA Special Publication 88-21 (Washington, DC: U.S. Department of Commerce, October 1988), and *The NTIA Infrastructure Repro: Telecommunications in the Age of Information,* NTIA Special Publication 91-26 (Washington, DC: U.S. Department of Commerce, October 1991). These NTIA reports gave some attention to information issues, but the primary focus was on telecommunications infrastructure trends and issues. For contrasting approaches, see U.S. Congress, Office of Technology Assessment, *Critical Connections: Communication for the Future,* OTA-CIT-407 (Washington, DC: U.S. Government Printing Office, January 1990) and *Informing the Nation: Federal Information Dissemination in an Electronic Age,* OTA-CIT-396 (Washington, DC: U.S. Government Printing Office, October 1988).

[25] See H.R. 1091, a bill to establish the Commission on Information Technology and Paperwork Reduction, Feb. 24, 1993; S.15, the Reinventing Government Act, Jan. 21, 1993; and S. 101, the Executive Organization Reform Act of 1993, introduced Jan, 21, 1993, and reported out by the Senate Committee on Governmental Affairs on Aug. 5, 1993. Also see Vice President Gore, op. cit., footnote 5; and Information Infrastructure Task Force, op. cit., footnote 23.