

## SUMMARY AND INTRODUCTION

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The Federal Government is the largest single source of scientific and technical information (STI) in the world. Scientific advancement and technological innovation depend on the open exchange of STI. Federal STI ranges from stream flow data collected by the U.S. Geological Survey, to imagery and technical reports on the Voyager II interplanetary mission produced by the National Aeronautics and Space Administration's Jet Propulsion Laboratory, and to the energy research database prepared by the Department of Energy.

The House Committee on Science, Space, and Technology asked the Office of Technology Assessment (OTA) to examine the opportunities and challenges facing the Federal Government with respect to the dissemination of STI. This staff paper presents the results of OTA's inquiry.

OTA found that the government does not have an overall strategy on dissemination of STI. An overall strategy would help (1) maximize the return on the substantial Federal research and development (R&D) investment, and (2) meet other national goals to which STI can contribute—such as improving the education of U.S. scientists and engineers, the international competitiveness of U.S. industry, and the strength of the U.S. civilian technology base.

An overall STI strategy is needed if the potential of new electronic technologies is to be fully realized, and if questions about access to Federal STI are to be resolved. Technologies such as online electronic databases or high-density optical disks and magnetic tape cartridges offer great promise for timely, cost-effective storage and dissemination of Federal STI. Electronic technologies offer the only real hope for managing the already massive Federal archives of scientific data and documents.<sup>1</sup> But at the same time, these

technologies aggravate conflicts between the basic need for the free flow of Federal STI balanced against concerns about protection of national security and international competitiveness.

Federal science agencies and interagency coordinating groups have made progress in a variety of STI areas. While these modest achievements were adequate for the earlier stages of the transition to a competitive, electronic environment, bolder initiatives are now necessary. Stronger executive branch commitment and leadership are essential to a successful STI strategy. This could be accomplished in part by expanding the role of the Office of Science and Technology Policy (OSTP) in the Executive Office of the President in STI policy, and improving coordination between OSTP and the Office of Management and Budget with respect to STI. Leadership also could be strengthened by: (1) establishing an OSTP outside advisory committee; (2) appointing a high-level interagency coordinating committee for Federal STI; and (3) upgrading STI dissemination functions within the agencies.

A comprehensive strategy needs to address several issues:

- basic principles of STI dissemination (e. g., user charges, user training, private sector involvement);
- basic policy on the free flow of STI;
- technical standards and directories for STI dissemination; and
- the roles of the individual Federal science agencies and governmentwide dissemination or archival agencies.<sup>2</sup>

This OTA staff paper is organized around the four questions posed to OTA by the House

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<sup>1</sup> In the earth and space sciences, the Interagency Working Group on Data Management for Global Change estimates that the Federal agencies manage a total data archive of roughly 100,000 gigabytes, which is equivalent to 45 billion pages of text.

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<sup>2</sup> These include the Superintendent of Documents sales program and Depository Library Program administered by the Government Printing Office, the National Technical Information Service, and the National Archives and Records Administration.

**Committee on Science, Space, and Technology:**

- **Are there unique problems associated with the dissemination of STI, or do Federal science agencies face the same challenge in disseminating information as other government agencies?**
- **What technologies could be applied to make dissemination of STI more efficient and effective for Federal science agencies?**
- **How can the Federal Government improve public access to its resources of STI?**
- **What changes could be made, both in internal agency organization and in inter-agency coordination, to enhance public access to STI?**

This paper answers these questions within a framework for an overall strategy on STI dissemination, and identifies key elements that could be useful in such a strategy. A followup OTA report (Spring 1990) will analyze selected strategic elements in greater depth.

The staff paper has benefited from comments on an earlier draft discussed at an August 1989 OTA workshop and circulated for outside review. OTA appreciates the participation of the OSTP, OMB, and Federal agency officials and members of the scientific, academic, library, business, and consumer communities, among others, who provided useful comments and information. The paper is, however, solely the responsibility of OTA, not of those who assisted us.