Overview

Computers have become a major technological tool of American society during the last quarter of a century. New developments in computer and communication technology promise within this decade an even more radical revolution in the way that information is collected, stored, used, and disseminated.

Large-scale integrated circuit technology, for example, allows hundreds of thousands of electronic components to be fabricated on a thin wafer smaller than a paper clip, thereby providing computing capability hundreds of times less expensive, less energy-consuming, and more reliable than was available only two or three decades ago. One result is the rapid growth in small, inexpensive computers that are the equivalent of machines selling for as much as a million dollars in the 1950's. Data communication networks using satellite and microwave technologies make it possible to provide access economically to large data bases from anywhere in the country or the world. Thus, networks of remotely sited computers can provide services such as credit card and check authorization or airline scheduling to users nationwide.

As these and other computer-based information systems–such as those used in air traffic control, military command and control, and electronic funds transfer–become more important to American society, they create corresponding public policy issues. Among the most important issues are the following:

- *9 Innovation, productivity, and employment.* —Continued innovation in information technology is a prime requisite for a healthy information industry and also offers the tools for improving the productivity of many other sectors of the economy. Likely policy issues include: support for research and development on civilian applications of computer technology, vitality of academic computer science, support for computer impact research (e.g., the impact on employment), and maintaining U.S. international competitiveness in computers and information systems.
- *Privacy.* --New applications of computer and communication technology-e.g., an automated securities exchange, in-home information services, electronic publishing, and the automated office—may generate issues over secondary use of personal information, surveillance, and the possible need for new approaches to privacy policy.
- Security .-The technology for securing computer systems from theft, sabotage, natural hazards, privacy abuses, and the like is improving steadily. However, the increasingly complicated systems now being designed and built make secure operations more difficult and suggest likely issues concerning the adequate protection of Federal information systems and vital non-Federal systems, and the development of the necessary data security and cryptographic capability.
- *Government management of data processing.* —It appears that, in general, the Federal Government is rapidly falling behind the private sector in its use and management of up-to-date computer and information technology. The 96th Congress enacted Public Law 96-511 (Paperwork Reduction Act of 1980) to help address this problem. And other *issues* may arise with respect to the effects of large-scale information systems on Federal decisionmaking (the "automated bureaucracy") and the process by which social values are reflected in information system design.

- *Society's dependence on information systems.—As* society moves toward electronic mail and other large extensively used information systems, likely new issues will concern the ways in which public policy can help balance the risks society may encounter versus the benefits, retain the option to end dependence on a particular system (avoid becoming "locked in"), and provide alternatives for those who prefer not to use electronic services. Research on the risks of system failure is needed, as is careful attention to how technology can be used to reduce these risks (for example, through distributed data bases and back-up computers).
- *Constitutional rights.* –Little legal precedent exists, in many cases, for applying constitutional law to issues raised by computer-based information systems. Areas of constitutional rights that may be affected by information systems include: freedom of speech and press (first amendment), protection against unreasonable search and seizure (fourth), protection against self-incrimination and guarantee of due process of law (fifth), right to a trial by impartial jury (sixth), and State guarantees of due process and equal protection of the laws (14th).
- *Regulatory boundaries.* –Evolving computer-based systems are crossing over and blurring traditional regulatory boundaries. Regulatory policy issues are likely to recur with respect to computer- v. communication-based services, electronic interstate branch banking, and electronic mail. As these systems expand geographically and move away from traditional definitions of industry structure, policy issues concerning interstate conflict of laws, Federal-State relationships, and antitrust may also arise.
- *Other issues.*— Four other issue areas were identified as important although not analyzed in great detail: computer crime, transborder data flow, information gap (for those who would be denied access due to technological illiteracy or other reasons), and computer software protection.