The original documents are located in Box 56, folder "Privacy - National Information Policy Report (2)" of the Philip Buchen Files at the Gerald R. Ford Presidential Library.

and Technology at the National Bureau of Standards, and at the Office of Telecommunications Policy.

Issues set forth in this cluster are among the most important facing the country. The policies adopted could have far-reaching impacts on all the other issues discussed in this report. Congress is considering major legislation on the structure of the telephone industry. It has again begun to look at the future of the Postal Service. It is showing renewed interest in computer policy. The ability of the Executive Branch to play a meaningful role in these accelerating processes is dependent upon giving them immediate and high level attention.

ISSUE 8 Establish A Rational Policy Framework For Balancing Issues Of Competition And Monopoly In Shaping The National Information Infra-structure

Background

The interaction between government policy and developing information technology has a profound impact on the national information infra-structure. This infra-structure provides the means by which information and data are transmitted. It includes modes which are sometimes not seen as part of similar and related systems, such as the postal service and satellite communications systems. While many of the new questions of information technology go to the regulation of the information itself, the shape and nature of the infra-structure remains a vexing problem and one which continues to arise in new guises. The focus of this issue is the information infra-structure and its ability to perform the social communications functions for the entire nation.

Major choices face policymakers regarding the

future course of regulation of telecommunications and the relationship of that regulation to new forms of information processing. The confrontation between traditional monopoly policies and new competitive regulatory policies has created problems in the form of conflicts between carrier and user, carrier and supplier, carrier and carrier, and regulated and unregulated service firm. The potential of electronic mail is an example of how new technologies in telecommunications raise significant regulatory questions in areas heretofore unrelated to telecommunications, in this instance, with respect to the United States Postal Service.

Discussion

The central issue facing government policymakers is the need to develop a rational framework of law and regulatory policy which would resolve the

conflicts and integrate competition and monopoly in such a manner as to assure the provision of needed services at reasonable rates and in a manner which will promote efficiencies and further technological innovation.

In the United States, the traditional telecommunications industries consist of private sector monopolies which are regulated by the Federal Communications Commission (FCC) in foreign and interstate carrier operations and by State public utility commissions in intrastate carrier operations. The Federal government's role in regulating these private firms is governed by the 1934 Communication Act 2/ which established the FCC and gave it responsibility for formulation of broad policies in conformity with the Act, the authorization of new facilities, and the approval of services and rates on tarriffs. The Act recognized that telecommunications products

and services should be provided by a limited number of regulated suppliers to assure a homogenous and relatively standardized nationwide network of services. The Act defined common carriers as private organizations each of which was to have a monopoly in a designated geographic area for the product or service it provided.

Several developments in the mid-1960's gave impetus to major changes in government regulatory policy in the communications field. Advanced communications technology led to a growing number of applications to the FCC by specialized communications service firms who sought to provide unique alternative communications systems which could not be provided by the established carriers and which fell outside the regular services provided by the established carriers and covered by monopoly regulation.

Rejecting arguments as to the applicability of regulatory principles of monopoly to these new forms of information processing and transmission, the FCC and courts, in a series of decisions over the past decade, 3/ have introduced policies of competition and open entry in the provision of specialized communications services.

Users may now obtain communications equipment from a source other than the carrier and have it connected directly to the carrier's communications lines. New terrestial (microwave) and satellite carriers are now permitted to provide specialized data transmission services not previously available from established carriers. Firms are now permitted to lease basic transmission capacity from traditional carriers and to use it to meet the special needs of their own customers. Unaffiliated users have been given certain rights allowing them to share private line services so they can be eligible for special rates and take advantage of networking efficiencies. And established carriers have been

allowed to compete in this new specialized communications service market.

Closely related to the question of regulatory policies for specialized communications services is the question of regulatory policies where regulated common carrier communications activities mesh with unregulated computer based data processing. The 1960's saw common carriers diversify and market data processing services. At the same time, computer firms involved in providing commercial time-sharing and data base information services began to offer store-and-forward message switching services previously offered by common carriers. Whether and what form of FCC regulation is appropriate to cover the new systems combining telecommunications and computer technology, is a very complex issue. The FCC has recently reopened its Computer Inquiry to review questions as to the nature and extent of regulation which could and should be applied along the continuum from pure data processing to pure communications.

In this regard the suitability of antitrust policy warrants consideration. Antitrust has been applied to attempts to monopolize data bases and information products. However, several questions exist with respect to its general applicability to the information area. One is whether current doctrines can be successfully expanded to cover the myriad problems of access and exclusivity in information systems. Another is the difficulty of determining relevant information markets. Questions of antitrust applicability arise out of the differences between information and tangible goods. The problem of determining what constitutes a natural monopoly, thus being more readily suited to direct control, is made more difficult by the blurring of distinctions between data processing and telecommunications. Finally, a paper prepared for the United States Committee on Scientific and Technical Information (COSATI) on the application of antitrust to information technology notes problems which arise because of the way social values permeate information questions. It speculates on the need for legislation to provide ultimate answers, "...antitrust decisional process being incapable, as presently constituted, of balancing social values with competitive values." 4/

Overall, these difficult questions are part of a more basic policy concern: the direction of telecommunications regulatory policy toward greater or less competition in the expanding field of information technology. While the trend has been toward greater competition and promotion of new entrants, there has been substantial resistance by established common carriers.

Those favoring competitive policies argue that competition promotes innovation, flexibility, and responsiveness to public need far better than does monopoly. They cite the benefits which have resulted from the limited competition which has been allowed: increased data transmission capability, new specialized services, the opening of new communications markets. They argue that established carriers are unable to provide the diversity of services required and that the economic situation does not justify the imposition of monopolistic conditions.

Those opposing the recent competitive trend and favoring the extension of monopoly to new areas of information technology point to the effect competition will have upon the provision of the

basic communications services which are subject to monopoly. They argue that competitive policies will destroy existing patterns of cross subsidies which, it is maintained, hold down rates paid by residential and rural subscribers. The competitors would move into areas where monopoly services are overpriced relative to cost (to subsidize the basic service) and leave the established carriers with a smaller share of the communications market. For example, it is argued that permitting increased competition will mean higher telephone bills for the consumer.

These are issues which underline legislation entitled the "Consumer Communications Reform Act", now under consideration in the Congress. 5/ Resolution of this confrontation could have a tremendous impact not only on established carriers and those competitive entities providing specialized communications services, but on other economic entities with interests in information technology such as the broadcast, facsimile, and computer industries and ultimately on the institutional structure of a major portion of our economy.

Technological change in processing and transmitting information, the merger of functions and modes, and the competitive environment arising as a consequence of regulatory policies point to the development of radically new information services. Trends toward the use of alternative communication techniques will sigificantly alter traditional means of information transfer. Thus, while banking, telephone, and postal entities have in the past operated with distinctive missions and limited competititon between them, the separate and distinct nature of each institution will become increasingly less discrete. Electronic funds transfer (where computer and telecommunications technologies are substituted for traditional commercial and financial transaction modes) and electronic mail (where electronic transfer of hard copy mail is substituted for traditional delivery techniques) are two principal examples.

Nowhere is the change likely to be more dramatic or the regulatory problems more complex than with respect to provision of postal services. Similar issues of regulatory policy (competition

versus monopoly) which have characterized the telecommunications/computer field, are emerging as a critical issues for the United States Postal Service. The economic, organizational, and legal context are, of course, different but the issues remain essentially the same.

The changing environment facing the Postal Service was described by one commentator as follows:

> Continued expansion of long distance telephone traffic, implementation of electronic funds transfer systems, and provision by specialized common carriers of electronic data and image distribution services shall further accelerate the reduction of already declining letter mail volumes. Recent proposals for banking reform, changes in communication regulatory policy, new interpretations of the private express statutes, have combined with major technology developments in telecommunications subsystems and intelligent terminal devices to provide significant impetus toward the development of national electronic data distribution networks which can be economically viable alternatives to the current U.S. Postal Service letter mail system. 6/

Federal policymakers must confront this difficult situation in the light of significant regulatory policy problems as well. The regulatory dilemma arises in two ways. First, as communications common carriers expand their services so that they are able

to transmit what is essentially a new form of mail, they have the potential of providing the kinds of services which are prohibited by the private express statutes, the legal authority giving the Postal Service its monopoly to carry letters. Second, and from a different perspective, as the Postal Service begins to supply mail service through the use of electronic communications, these services will begin to approach the structure of the traditional communications carrier, which under the Communications Act of 1934, is subject to FCC regulation.

The carriage of mail is a monopoly operated by the Federal government under authority granted by the postal express statutes. 7/ The new technology, however, has reopened the entire question of the Postal Service's monopoly and the relationship of the postal service to electronic communications. The dynamic environment in which the Postal Service now finds itself clearly indicates that changes must take place to assure a more efficient and cost effective means of mail transmission.

The regulatory and policy decisions which face the government in determining the future of the postal monopoly are not unlike the decisions which must be made involving competition in the telecommunications specialized services field. For example, the following questions are pertinent to both: whether the traditional monopoly can adequately provide the services demanded; whether the economic situation constitutes a "natural" monopoly environment; whether competition is likely to lead to innovation, flexibility, and responsiveness to consumer requirements; whether the advantages of competition outweigh the harm that may come to the traditional monopoly structures.

Supporters of the postal monopoly say that without monopoly protection the Postal Service would be unable to fulfill its legislative mission of binding the Nation together and providing service to all communities and regions of the country. It is argued that without monopoly the ability of the Postal Service to maintain uniform postal rates, regardless of distance mail is to travel, would be undermined since the private sector could underbid

the government on the more popular routes leaving it with only the more costly, rural business and destroying the cross subsidies which permitted the uniformity of rates.

It is maintained by those who support retention of the Postal Service monopoly that the government is in a better position to serve the public and would do so more effectively than would private industry. They argue that the special postal services (window services, franking privileges for the blind, security protections for the mail, and rural delivery) would not be provided for by the private sector as the return on cost is likely to be too low.

Those who believe that the postal monopoly should be eliminated or modified to permit competition by the telecommunications industry cite the inability of the Postal Service to provide economically efficient postal service despite the advantage of its monopoly and tax exempt status. Even now the Postal Service finds itself losing revenue and customers to the more innovative and potentially more effective and efficient electronic telecommunications industry.

Those who oppose continuation of the monopoly dispute the argument that competition will result in cream skimming leaving the Postal Service with losing postal routes. While there may be some routes of significance that would be lost to the private sector, the anticipated increase in the number of private postal entities and consequent increase in the quality of the postal service due to the innovations which is likely to occur as a consequence of competition, may well expand the postal market. Thus with decreasing cost and expanding markets, more consumers may be better served at a lesser cost and the Postal Service would capture its share of the new market, improving its chances of survival although in a more limited capacity.

It is argued that competition would spur the development of technologies which make service to remote areas more economically feasible. Furthermore, such specialized services as security measures and window services are not likely to be done away with as long as there is a demand for such services.

The second major question in this area is whether the Postal Service, assuming it was authorized to provide mail services through its own electronic communications network, would compete with the telecommunications industry and be subject to regulation by the FCC. This is the reverse of the question of whether the telecommunications industry would be able to compete with the Postal Service in providing electronic mail. Is there, for example, a necessary conflict with and dilution of stated Congressional policies with respect to the missions of the FCC and the Postal Service? Certainly it would appear that the unregulated entry of the Postal Service into the electrical communications marketplace would have significant implications for effective and rational FCC and state regulation of the communications industry.

ISSUE 9 Determining Appropriate Policies And Procedures For Federal Government Procurement And Research And Development Activities Because Of Their Impact On Information Systems

Background

The policies of the Federal government for the procurement of information processing facilities and services and the funding of research and development in the field of information technology have a tremendous impact on the structure of the market, the industry, and the technology itself.

The Federal government is by far the country's largest procurer of commercial telecommunications and computer facilities and services. Government procurement procedures are important because of the amount expended on plants and services and the system design requirements imposed by particular government needs. For example, when the government procures plants and services from a single entity, the recipients may be accorded a significant if not dominant market position by fiat. In addition, it may receive an indirect competitive advantage resulting from its application of advanced technology and sophisticated know-how developed to fulfill government requirements. When government decides to procure and

operate itself a system dedicated to a particular use, in lieu of leasing public facilities, it removes a substantial amount of business from the private sector.

The Federal government also supports billions of dollars of research and development annually. This expenditure results in an enormous, continuous flow of reports and documentation containing the results of research and development efforts. This new information is initially disseminated to targeted audiences and then, later, indexed and abstracted for retrospective use. Because of the magnitude of United States research and development programs, they make a substantial impact on the scientific and technical infra-structure in the public and private sectors. The research and development sector influences practices in the publishing industry, determines the nature of commercial information services offered by the information industry, affects the tempo of computer application in the professional societies, and shapes the development of new information technology.

Discussion

Federal procurement policies were historically developed in the context of sole-source procurement

from monopoly carriers. Given the emergence of new specialized communications/computer services and consequent cost savings, there is a need to review the government's traditional policies. In seeking to obtain the most effective and economic information processing and exchange capability for the lowest price, the question is whether government procurement procedures should consider how government policies affect the market structure by either encouraging competition or preserving existing monopoly positions.

Public Law 89-306, the Brooks Act, is the principle legislative authority governing the procurement of computers and related systems. The Brooks Act was intended to encourage common usage of computer hardware facilities and to achieve economies in the acquisition of same. Recent reports by the General Accounting Office question whether the intent of this bill has been achieved, inasmuch as procurement authority has been achieved, inasmuch as procurement authority by the General Services Administration. Conversely though, critics of the procurement process argue that GSA is already too deeply involved in data processing acquisitions and that further de-centralization represents the best means of achieving improvement. This question is whether the present role of central management in equipment and software acquisition is the

most appropriate one; if not, what changes are desirable.

It should be borne in mind that procurement policies have the potential to affect information interchange, accuracy of data, and the quality of data bases, and can have implications for freedom of information and privacy. Some of these issues are discussed elsewhere in this report.

Just as Federal procurement policies impact upon the information environment so do Federal research and development policies. Rarely, however, is the close correlation between research and development and the resulting information systems fully appreciated. One example is found in the scientific and technical information area. There is a great disparity in the National Science Foundation's annual budget between expenditures for scientific and technical research and expenditures for science information research. In the last ten years the budget for the latter has decreased from a high of $14 million to a low of $4.6 million while the budget for the Foundation as a whole has steadily increased. This imbalance implicitly calls into question the policies that lead to such decisions. No one disputes the need for performing research and development in science and technology but the amount of attention and support being given is viewed by some as disproportionate to the need for ensuring optimum utilization of the fruits of this effort.

The non-scientific area can also benefit from judicious use of government research and development funds and other incentives. Examples of present efforts include the Department of Health, Education and Welfare's sponsorship of several experiments in telemedicine and education involving remote two-way video patient-doctor and teacher-student communications by coaxial cable, microwave and satellite, and National Science Foundation experiments using satellites to provide educational services to rural areas.

What is an appropriate annual expenditure for information research and development? What Federal policies can best assure the most productive utilization of research and development results? What are the respective roles of government and the private sector in the dissemination of information? Should more long range preparatory research be instituted? Are resources sufficient to do more than react to crises?

Does the general public have a greater proprietary interest in technology developed from government research and development funds than that which has been funded entirely from private capital? If so, what are the limits of creation rights that should attached to such technology? Should affirmative disclosure of the technology and know-how be required in order to facilitate early public exploitation?

Does government unduly distort the market for services or the infra-structure of related industries

through new technologies developed from government-sponsored research and development? If so, does it have an obligation as a regulator to mitigate the effects of its research and development activities?

Government may affect societal evolution by funding experimental demonstrations in information and communications technology which probably would not be developed without government support and which have the potential of changing patterns of society with widespread adoption. What standards are useful in determining the adequacy of private sector research and development initiatives and to measure the relative public good to be derived by government intervention?

To what extent should government research and development funding programs be permitted to determine the direction of future technological developments in the information transfer field?

These question, like others raised, require careful study and difficult choices from among legitimate, competing values. Policymakers must consider these questions in the light of their impact on the duties and responsibilities of the government itself, as well as, upon the information industry and society as a whole.

ISSUE CLUSTER IV

INTERNATIONAL IMPLICATIONS OF INFORMATION POLICIES AND DEVELOPMENTS

The growing reality of instant world-wide communications opens a host of new opportunities for economic and social development for all nations. Through such technological advances as satellites and reductions in transmission costs, telecommunications is rapidly becoming independent of distance. Widespread public and private sector applications of networks strongly support the concept that information technology is becoming extensively internationalized and will blur the effectiveness of territorially bounded regulatory authorities.

Indications of the level of network activity by multinationals are demonstrated in banking, airlines, hotels, car rentals, credit, insurance, and computer service bureaus. The scope of government networks involves law enforcement, passport and immigration, taxes and social insurance, and in some European countries, exchange of voting information on foreign residents. Private user networks illustrate the most dramatic exploitation of new linkages among organizations and among

different countries.

Among the major networks is SITA, the high speed flight reservation network, connecting 160 airlines with 6,000 branches in 90 countries. Other important commercial networks include TYMNET, a trans-Atlantic time sharing network available from all cities in the United States and linked with European capitals; CYBERNET, a network built around six processing centers in The Hague, Frankfurt, London, Ljubiljana, Paris, and Stockholm; GEIS, a satellite system allowing European users to process data in the United States; SWITCH, based in 14 countries offering on-line services through 300 terminals connected to 30 major processing centers and SWIFT, the world-wide interbank financial telecommunications service which will have capabilities for 100,000 messages for international payments transactions per day. 1/

It is often suggested that this new communications nerve system accentuates the interdependence of nations. Because of rapid change, new and potential ranges of applications, and related social and economic implications, international organizations are well behind in meeting their responsibilities

to fix standards and develop necessary levels of harmonization for maximum transnational utilization. The result is growing discord expressed by users, carriers, manufacturers, and governments concerned with legal, proprietary, and data protection in international networks.

As spirited and successful as pioneering efforts in international data networking have been, obstacles remain to attaining full use of technological potentials. Dr. Betsy Ancker Johnson, Assistant Secretary of Commerce for Science and Technology has stated, "Before the full utility of computer communications can be realized, especially on a global scale, some non-technological inhibiting factors must be overcome." 2/ Secretary Johnson indicated these inhibiting factors lie in the slowness of institutional response to technological change, the protective measures taken to safeguard data transfers, and the massive financial commitments required.

This range of challenges has been put in a constructive context by R. E. Butler of the International Telecommunications Union:

> The time has come to recognize that it is of national and international interest to agree on certain principles and policies on computer communications so as to facilitate the elaboration of national strategies for shaping the direction of systems and equipment development and their use.... The telecommunications facility for rapid transportation of data, from one country to another, and the rapidity with which information in data banks can be changed, cancelled or transformed, introduce new aspects which will not have been encountered previously in governmental control and functioning. 3/

What is to be the national strategy of the United States? How is it to be formulated? Who will marshall the resources and expertise to devote adequate analysis to the policy questions presented? The failure to adequately address these questions may entail costs both in terms of the competitive position of the United States and in the preservation of uniquely American values, such as a public/private mix in communications and information.

ISSUE 10 — Meet the Need For Interaction Among Developed Countries To Strengthen The Economic, Commercial And Social Dimensions of Information Technology

Background

The changed conditions of international telecommunications is reflected in the growth of activities engaged in by border-spanning organizations such as multinational enterprises, cross-cultural affinity groups, and even military commands. 4/ These new relationships will require a restructuring of the international telecommunication policymaking process. It is not only the proliferation of international networks which raises the need for coordinated international action, but also the growing dependence by governments and organizations on such information exchange services.

Discussion

These new conditions affect two separate categories of policies. One is the conduct of transnational organizations and the impact of such

organizations on international affairs. A second is the implications for telecommunication carriers. Policy considerations and forums for treating them have changed in recent years. Now that telecommunications is abundant and diversified, the concerns of the participants go beyond rate and standards issues.

There could be a shift away from nationalistic policy positions, and movement toward cooperative strategies rather than competitive tactics. An overriding consideration in the development of national policies must be to avoid disastrous consequences in international information exchange.

The widely scattered actions by governments of many industrial countries indicate that their policies to realign internal institutions to meet current requirements are only now beginning to take shape. One major example of national information policy design is The Plan for an Information Society - A National Goal Toward the Year 2000, also known as the "Japanese White Paper." 5/ It was prepared by the Computerization Committee of the Japan Computer Usage Development Institute. The concept of the report is based

upon the belief that in advanced countries, de-industrialization is underway, and that the world is shifting to an information society, "a society that brings about a general flourishing state of human intellectual creativity" by fully employing information and knowledge. The report provides a long range plan for developing an information society in Japan but with an intermediate goal to establish "the computer mind" by 1985.

Under the auspices of the Organization for Economic Co-operation and Development (OECD) an international economic alliance of Western countries, a number of policy issues have been defined:

- Evaluating the impact of innovation on the labor force, working conditions and the restructuring of industry;
- Improving competition in the supply of computer and telecommunications goods and services to lower costs of information and make it more readily available to industry and the public;
- Fully using the productive tools of information technology in public sector applications, such as public administration, health care, local government, and environment;
- Establishing common principles underlying national legislation on privacy protection and the right of access to information;
- Avoiding barriers to the transborder flow of data over international information networks;

- Developing closer relationships in policy formulation among the various participants in the information, computer, and communications field;
- Careful monitoring of substitution among the components of the emerging information sector so as to minimize economic and labor disruptions;
- Improving the relations between government and the citizen through increased public participation in decisions through building up of new information channels; and
- Evaluating the role of "information trade" as an important issue for consideration between the developed and the developing countries.

The degree of commitment to new policy refinements and need for mutual reinforcement among OECD member countries depends both on United States initiatives and the strengthening of machinery inside the respective government to address these issues at an international level. Currently, responsibility for these matters within the United States is greatly divided. To deal with this situation, an ad hoc group has been formed under the leadership of the Department of State. But in the absence of clear authority, greater visibility, and support at higher governmental levels, this group has had difficulty in bringing attention to these issues,

convincing other nations of the seriousness of United States interest, or even preventing the trade-off of these concerns. The group is no substitute for the involvement of a more permanent and powerful governmental unit.

Recognition of the internationalization of information technology is critical to incorporating many of its significant new dimensions into the foreign policy process. The many issues inherent in information technology may remain fragmented until the tenets of a United States information policy are understood. Nevertheless, implications for foreign relations are becoming extensive even now. The following issues could be on an agenda for United States attention:

- Assuring a strong competitive position in the world for computer, telecommunication, and other products and services of information technology.
- Supporting telecommunications network development by pressing for urgently needed new international standards and regulations.
- Determining the role the United States should play in promoting a "global information strategy" based on full utilization of information technology.
- Bringing about a closer harmonization

of information policies among governments of industrial countries through programs of international organizations and contact between private organizations in the United States and abroad.

- o Preparing an appropriate response to the challenge of maintaining the open flow of information among nations while taking into account the necessity to protect personal and proprietary data.

- o Advancing economic and social objectives of less developed countries through the expansion of information technology transfer and assistance programs.

ISSUE II — Establish Necessary Rules And Data Protection Mechanisms To Allow Continued Free Flow Of Information Across National Boundaries.

Background

The decreasing significance of national boundaries to telecommunications and information transfer is raising a number of policy questions as to the potential need to redefine the principles of free flow of information among countries.

National governments generally welcome information received from entities outside their borders but have

historically exercised control over some elements of it. For example, all countries have regulations on obscenity, public morality, sedition, and national security. 6/ These regulations apply to transborder information as well as to internally generated information. In addition, where economic value attaches to information, especially of a scientific or technological nature, there is often considerable pressure for some form of governmental regulation.

While the unrestricted flow of information is asserted in Article 31 of the International Communications Convention (Montreux, November 12, 1965, 18 UST 575), Article 32 states that sovereignty is reserved in the form of the right to stop transmission which may appear dangerous to the security of the State or contrary to their laws of public order or decency. Under Article 33, States can suspend the international telecommunications service for an indefinite time.

In the preamble to this Convention, contracting parties agree "with the object of facilitating relations and cooperation between the peoples by means of efficient telecommunications services," but do so "fully recognizing the sovereign right of each country to

regulate its telecommunications." It remains to be seen how the broad impact of technology will affect traditional views of sovereignty or impose some normative dimensions to guide the national carriers through new international arrangements.

Discussion

Transborder data transmission may receive greater attention by governments because extraterritorial flows involve personal information for processing, storage, or administrative purposes. 7/ There appear to be four main streams of concern:

- o National sovereignty is affected where data resides abroad because established domestic regulatory mechanisms cannot reach the data and the absence of bilaterial or multilateral agreements prevents proper maintenance of the data and its return upon demand by the owner organization or government authority.
- o Citizens cannot exercise rights with respect to information residing outside the orginating country, even though the country has laws which guarantee the individual rights of access, correction, and control of dissemination of his personal records.
- o There may be adverse economic consequences if a significant amount of a country's data is stored abroad. The development of advanced information technologies could be retarded and result in loss of enterprises supporting information services and employment. In extreme cases, some countries would become "data poor" while others would become "data rich."
- o An unwanted impact on a nation's cultural identification may result if large stores of information are "homogenized" with records of nationals of various countries or where administrative decisions are taken by persons of a different nationality. 8/

For the United States, technological, commercial, and government interests require the unfettered use of terrestrial and satellite communications. It may be premature to judge whether such concerns expressed over foreign flows of personal data will constitute disruption of information movement, but how to attend to these problems is a ripening issue in the view of several countries.

Analysis of these matters is and has been treated largely in a multinational context by the Organization for Economic Co-operation and Development, the Council of Europe, and the European Common Market and reviewed in a report of the United Nations Secretary General. 9/ However, a special set of circumstances exists in terms of the North/South dimensions of Canadian-United States

data flow which illustrate the nature of the four areas of concern.

The Canadian Privacy and Computer Task Force in 1972 surveyed a number of American organizations to secure information data stored on Canadian citizens, what the information was used for, and what rights were accorded the individuals concerned. 10/ As part of its 1976 survey on computer communications, the Canadian Department of Communications is again asking major multinational organizations having offices or headquarters in the United States about their data transfer practices. The questionnaire states, "Canada has not, to-date, taken a specific position with respect to the whole question of privacy and the transmission of data across its borders. It has preferred to obtain a clearer picture of what type of data crosses the international border." 11/ Among the questions posed in the 1972 Task Force study was whether when "fundamental cultural or social, or even economic interests of a State are seriously jeopardized by outflows of data, unilateral action on the part of the affected State may be justified." The study stated, "This could take the form of regulating particular activities that give rise to the outflow

of data or controlling the flow itself by a variety of legislative and regulatory techniques." There has yet to be a government position announced and Canadian officials are participating in discussions involving possible multilateral action through the Organization for Economic Co-operation and Development. 12/

In Europe, the emergence of several data protection measures enacted or currently before parliamentary bodies has raised transborder data flow questions. The Swedish Data Inspection Board, a licensing authority with jurisdiction over all automated personal registers, has asserted that for approval of transfers of data abroad, the receiving country processor or user must be required to meet similar government imposed data protection standards. In at least two instances, transshipment was denied because of an absence of appropriate statutory guarantees. Norway, Denmark and Finland are joining Sweden in a common approach to data protection, setting a Nordic area standard. Austria and Germany would bar export of certain categories of sensitive personal data unless strong reciprocal laws are in force.

Because of the commitment to both the free flow principle and preservation of human rights, the Organization for Economic Co-operation and Development and the Council of Europe are pursuing preparatory work for a harmonization of national approaches which may result in an international convention. Already, the negative side of the issue has been raised in different ways, such as creation of "data havens" or sanctuaries, embargos on certain types of information, reciprocal legal rights 13/, maintenance of duplicate records to those transshiped, registration requirements, and export duties placed on information to monitor outward flows. In a recent statement on this subject, Congressman Barry M. Goldwater, Jr. stated:

> We are rapidly approaching an international data-spasm -- transnational data flows that operate under no restraint or accountability. What concerns me greatly is the information pirate, similar to the oceangoing pirate, who will pillage individuals and nations of their information valuables if they can retreat to a safe haven. 14/

This is an issue which adds a whole new dimension to the information policy issues discussed elsewhere in this report.

ISSUE 12 — Respond To The Recognition By Less Developed Countries Of The Importance Of Information Sector Economic And Social Development

Background

It is becoming widely accepted that improving the utilization of information by less developed countries will accelerate economic and social development. For several years, agencies of the United Nations system have promoted applications of computer science and technology through technical assistance and projects involving procurement of computers for varied governmental programs. The foreign assistance programs of the United States and other industrial countries have similarly supported the introduction of computers and telecommunications systems to assist in census-taking, financial management, tax administration, statistical services, education, and other governmental responsibilities.

A recent report of the United Nations Economic and Social Council stated that:

> In spite of the great potential in the application of computer science and technology, and although significant advances have been made towards its more effective use, the full potential of this technology as an aid in the development of developing countries has yet to be realized. 15/

A number of priority areas have been designated for special attention, including education and training of computer personnel, improved procurement of computer-related products and services, encouragement of transfer of software information, establishment of special financial arrangements for purchasing computer products and services, building systems to transfer technological information, and assistance in computer/communications applications. Many less developed countries have taken steps to coordinate all information processing activities according to a master plan, so as to introduce more coherent planning and decisionmaking capabilities.

Discussion

The movement towards national information policies reflects decisions by countries to exercise greater determination on how their economic development

will be organized and implemented. The three main characteristics of the approaches being taken are:

- Preparation of a national strategy under the direction of a head of state, cabinet advisors, and experts in information technology to unify all major aspects of information collection, processing and application;
- Creation of a central authority with policy responsibilities over procurement, education of personnel, application areas and planning; and
- Organization of information technology support requirements in terms of computer equipment and expansion of telecommunications services.

The consolidation of information technology and its applications under such master plans is termed "informatics" by developing countries.

The growing commitment of less developed countries to policies designed to guide and control the development of information technology and adapt it to a wider range of purposes indicates a desire for long term coordination by abandoning ad hoc projects involving information processing. This may represent a common core of interests upon which a stronger basis of cooperation by the United States and less developed countries could evolve.

The Secretary of State at the recent UNCTAD IV meeting in Nairobi underscored our concern to expand the application of technology for development. In his statement, the Secretary presented some of the obstacles to rapid and effective technology transfer from industrialized to developing countries, mentioning the:

- o Unsuitability of advanced technology to the needs of developing countries,
- o Deficiencies of adequate information and expertise which best meets their needs,
- o Shortages of trained manpower to select, adapt and effectively manage technology, and
- o High capital investments required. 16/

Overcoming these impediments is the very goal of the national informatics policies of the developing countries.

The objective of transfer of information technology has been raised under the program of a new international economic order: "that developed countries should facilitate access of developing countries, on a preferential basis, to 'informatique' suited to their specific needs." 17/ New frameworks

of national coordination for information technology offer potentials for technical and managerial advice and assistance by the developed countries, including the United States. Furthermore, the United States response to its own national information policy issues may reinforce the commitment of less developed countries to better design and direct their information resources. It may also affect the shape which interdependence in the information sector will take.

ISSUE CLUSTER V

PREPARING FOR THE INFORMATION AGE

While many of the issues of the Information Age demand immediate resolution, others require a more long range and sustained approach. Despite the fact that they are less immediate, these issues are not less significant and should be addressed as part of the Nation's long-range policy planning.

The issues in this cluster present some of the broad implications of information technology. They are both an opportunity and a challenge to the Nation.

ISSUE 13 Consider The Economic Implications Of The Growth Of The Information Sector

Background

Economic policy has become accepted as one of the principal responsibilities of the Federal government. Under these circumstances, attention to the changes that are occuring as the result of the advancing Information Age has become increasingly important.

Whether one is willing to go as far as one distinguished commentator to hypothesize that the economic difficulties of the mid-1970's were symptoms of this social transition, 1/ the available statistics are sufficiently compelling to argue for attention to and understanding of these trends. Concepts of productivity, natural resource constraints, inflation and international interdependence may need re-examination. Widespread information networks, particularly as they begin to take on the characteristics of utilities, could have significant economic effects. These are areas of policy analysis in which government should become involved.

Discussion

It has become commonplace to assert that the United States is becoming an information society. Yet the changes in social and economic patterns that this entails are not always apparent. This is particularly true when information, the invisible resource, is involved. The products of the industrial age were skyscrapers and bridges, and were readily apparent to all observers. The products of the post-industrial age are intangibles, symbolized by data bits in computers.

Nevertheless, since the outbreak of the Civil War, the United States has evolved from a predominantly agricultural society. Between the turn of the century and the end of World War II, the United States became a predominantly industrial society. Beginning in the 1950's the information sector became predominant.

These developments are shown by Figure III (p. 156) 2/ which reflects the nature of the work of Americans. Industrial production replaced agriculture as the largest employer of the work force, only to be replaced in turn by the information sector. In addition to

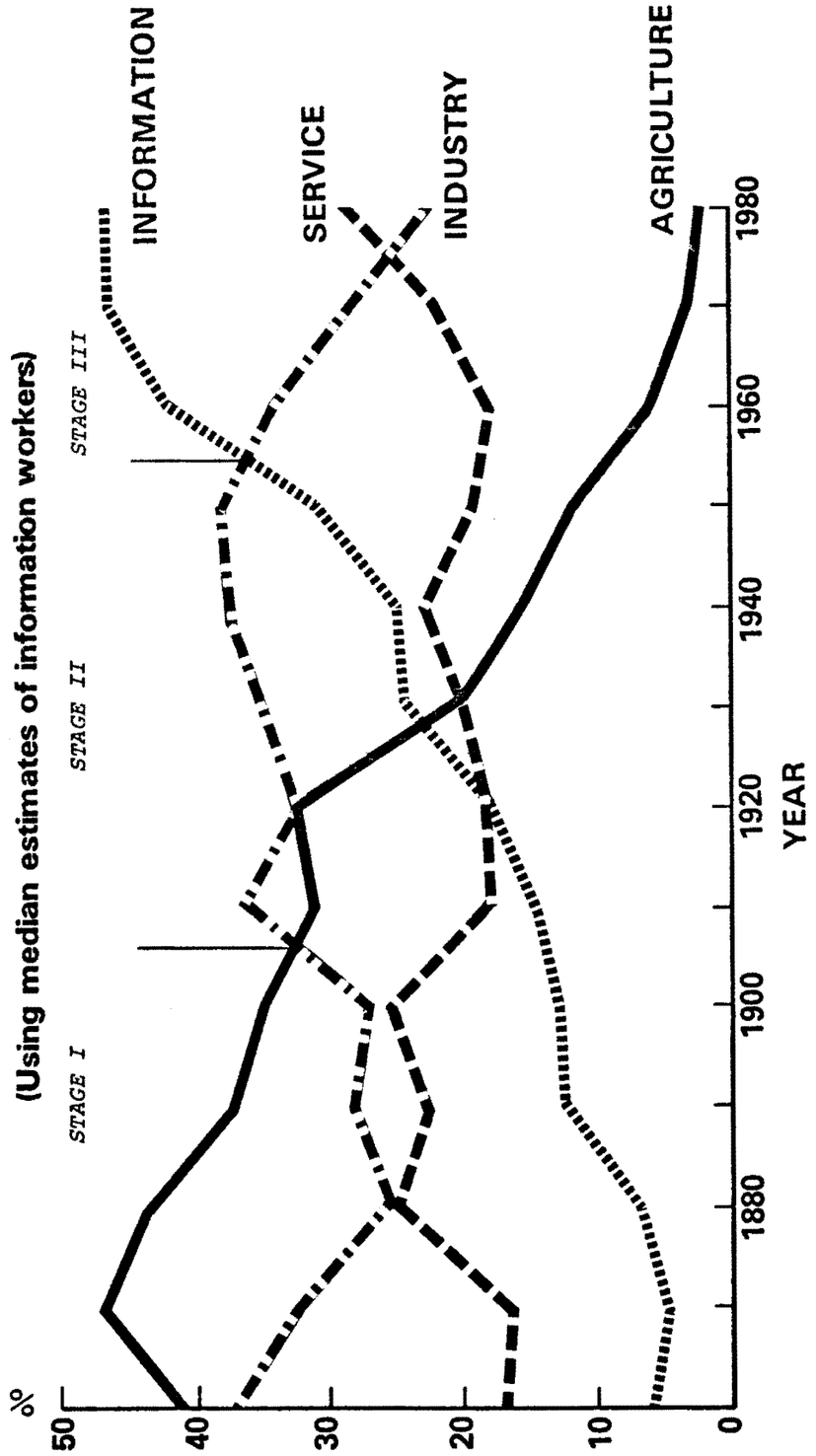

FIGURE III

providing an ever larger portion of the work force, the information sector is supplying an even greater proportion of national income. Figure IV (p. 158) 3/ demonstrates in a time series the portion of national income from 1930 through 1974 that was derived from the primary and secondary information sectors.

Primary information industries are those that sell information goods and services to other firms, individual consumers, governments, or in international trade. These activities are measurable in the marketplace as sales. Secondary information activities take place within individual firms or governments and are consumed there. Consequently, these information transactions are not measurable directly as sales. Nonetheless, internal information activities play an important role in providing jobs and assuring the success of economic activity. Examples of secondary information activity include personnel, accounts receivable and payable, research and development, litigation, paperwork, planning, marketing, and other information uses that the firm or agency generates and consumes itself.

Earlier transitions from one economic era to another have demonstrated that new forms of

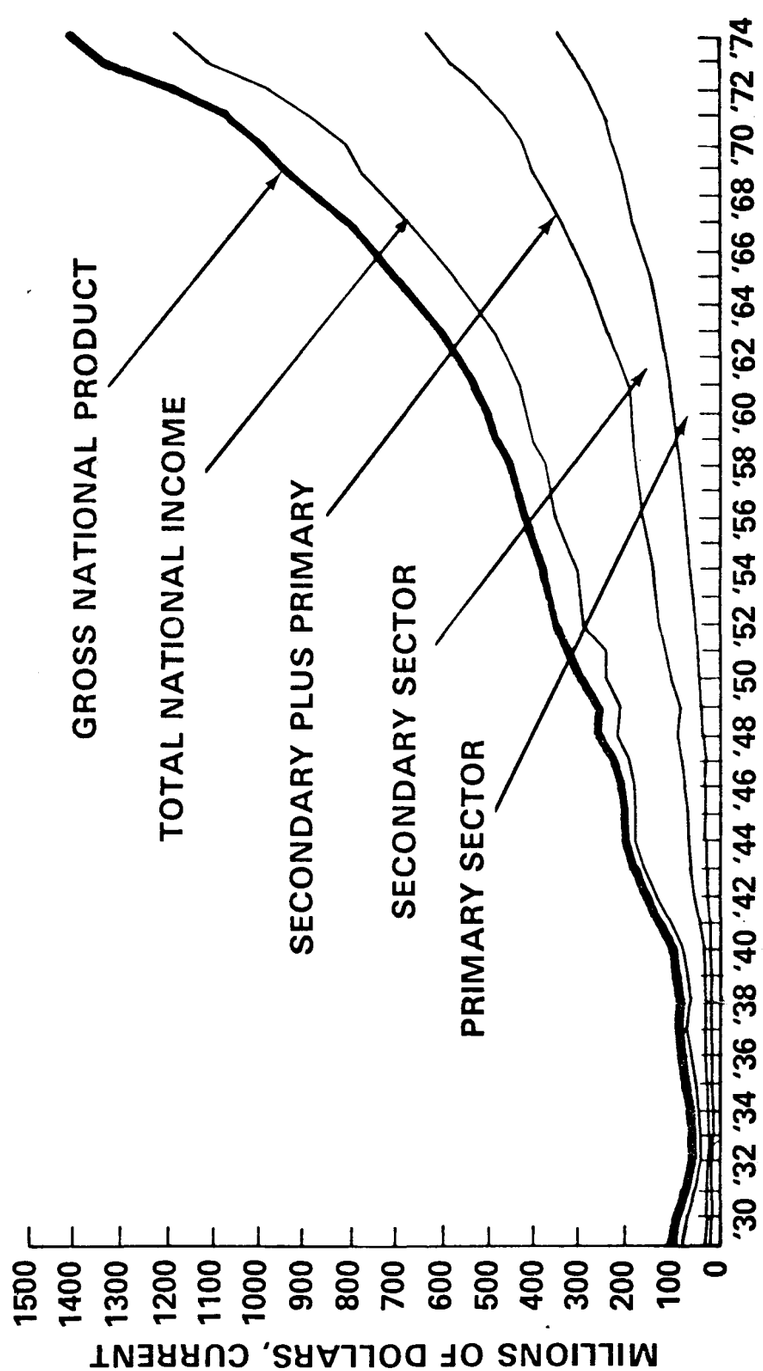

FIGURE IV

economic activity become superimposed over previous economic systems. Thus, the coming Information Age will not be a substitute for agriculture or industry; rather, it reflects the addition of a new layer of economic activity which joins and changes the other, earlier activities.

Efforts are now underway to refine characterizations and measurements of the impact of information in total economic activity. Steps in this direction are already being taken through studies in the Department of Commerce, the Office of Telecommunications Policy, the National Science Foundation, and elsewhere in the government and private sector. These projects could result in more sophisticated tools for policy analysis. This work should be encouraged.

The economic implications of the continued expansion of the information sector have caused some speculation about their relationship to national growth policies. At least since the dramatic publication of The Limits To Growth 4/ by the Club of Rome in 1972, economists and others have been involved in strenuous debate over the desirability of economic growth. This heated debate, in which

Americans have actively engaged in recent years, has caught the attention of some of the nation's most prestigious intellectuals. Herman Kahn, for instance, has become a leader in resisting doomsday prophecies and some of the more dire predictions of others have been tempered as a result of his recent analyses.

But wherever one stands on the issues of the consequences of future economic growth, one interesting possibility presented by the Information Age is the prospect of some relief from the limits imposed by finite resources. A shift in the composition of output in the direction of services, particularly services that require comparatively little energy, could provide such relief for the United States and the rest of the industrial world. In the post-industrial United States these processes are already at work in the development of the information-based social and economic system.

> There are two aspects of this potentially unlimited growth. One is that some present consumption and much new consumption could be diverted into information-intensive rather than energy-intensive goods and services. The other is that continued application of information (for example, research and development) could lead to more efficient use of available energy and materials, permitting real growth of output given stable inputs. 5/

At the same time, post-industrial policymakers should consider the inflationary and deflationary potential of information sector economic activity. Other labor intensive sectors of the economy have proved to be among the leaders in the generation of inflation. Unlike these inflationary segments of the economy, however, the information sector consumes little energy or other resources.

Economic considerations stemming from increased energy cost can have another form of interaction with developments in information technology. Experiments are underway to determine the extent to which the capabilities of communication and information transfer can be used to reduce energy consumption, relieve population density, and free business from the constraints of space.

Essentially, the information sector is composed of services. Traditional measures of productivity do not reflect the quality of the service rendered. For example, market prices of services vary in such a fashion as not to relate clearly to productivity. Social costs of alternative means of achieving comparable goals are not included in productivity measures. Particularly in terms of evaluating the inflationary and deflationary elements of the information sector, policymakers must work toward developing new productivity indices for the information sector.

The impact of the Information Age on the nature and quality of work should also be considered. Technological obsolescence usually refers to machinery, but there is a form of technological obsolescence that affects individuals as well. It is very possible for a person trained only a few years ago to have that training by-passed by change that takes place so rapidly that the person has no opportunity to maintain an adequate level of skills while performing daily at the job. It is possible, then, that "individuals often become, over time, uneducated and therefore incompetent at a level

at which they once performed quite adequately." 6/ As this phenomenon becomes more common, substantial social tension can be expected.

Finally, some are beginning to warn that the experience of the knowledge worker in the future may repeat many of the problems currently faced by automated workers in industrial plants. In the words of one observer:

> ...the work environment of the knowledge worker - that is the office - whether it be in manufacturing, banking or in government, will more and more resemble a factory in its physical layout, its work through-flow, and that the same subordination of the worker to the process will be evident. 7/

These pessimistic predictions need not prove true. The Information Age offers the possibility of new jobs to replace those which are disappearing. It offers the possibility that work and recreation can become more stimulating and that people can be continually retrained to keep pace with technological and managerial advances. What this will require is a definition of the relationship between man and the new machinery that will be adequate to meet the challenges of a new economic age and governmental policy which can capture the benefits of that age.

ISSUE 14 Consider The Implications Of Information Developments On The Institutional Relationships Between Governmental Units

Background

Governmental authority in the United States is divided among a multiplicity of units. At the national level, the Constitution vests governmental powers in three separate and equal branches. Beneath that level, when regional and district groups providing special services are added to the list of more formal jurisdictions, there are upwards of 75,000 units.

In this highly complex system, information technology has become a significant factor in the blurring of distinctions between various governmental units. Old methods of conducting the business of government which were built upon these distinctions may change; whether traditional relationships between these governmental units will continue in their current form remains to be seen.

Much of the controversy which has arisen between Congress and the Executive Branch in recent years has been over access to information. Among the more notable confrontations have been those concerning rights of Members of Congress to use the Freedom of Information Act, the scope of executive privilege, and legislation which would clarify the procedures by which Congress may assert its right to information held by the Executive Branch - a function of its oversight power. While these issues have received the greatest public attention, the increasing possibility that Congress could tap directly into the information systems of the Executive agencies has largely gone unnoticed by the public. Such a step could truly revolutionize the relationships between the branches of the Federal government.

The sharing of Federal information with state and local governments raises another set

of issues. Many of the governmental units in this nation came into existence many years ago when transportation and communications were considerably less efficient than now. As these services have improved, the potential for increased sharing and more efficient allocation of responsibilities between the Federal government and other governments has increased. The political obstacles to such re-allocations are formidable, but the possibility that they could occur should be taken seriously.

Discussion

Separation of Powers

Among the factors which are changing the picture of Executive/Congressional relations are the following:

- Congress has embarked on a vigorous program to automate its own information processes. The program involves the use of computers, preparation of data bases, and the distribution of consoles to Congressional offices. These developments are providing Congressmen and their staffs with a sense of familiarity with electronic data processing equipment which has previously been lacking. It is bringing "information literacy" to Capitol Hill.

- Congress is now in the position to accept Executive Branch generated information in machine readable form. This makes possible direct computer linkage between the branches.

- Congress has created its own information generating community in the course of establishing institutions to enhance its ability to "check" the Executive. The new Budget Committee and the Office of Technology Assessment, as well as the older General Accounting Office, provide Congress with a powerful set of tools for policymaking.

- The upgrading of the Congressional Research Service, part of the Library of Congress, is a key element of the Congressional program.

The current procedures by which Congress obtains information from the Executive Branch could be radically altered if the use of these programs and institutions is maximized. Committee hearings serve to heighten public awareness about issues and provide exposure for Members of Congress, but the nuts and bolts of oversight

may be found in the future in the utilization of the new information technology. If this happens, the ability of Congressional Committees and offices to interact with Federal agencies could affect the decisionmaking processes of government, and the oversight functions of the standing committees will take on new meaning.

For years, a sense of mutual accomodation with respect to the sharing of information was lacking in the relationship between Congress and the Executive Branch. The atmosphere has often been combative and only sometimes cooperative. Arrangements governing information sharing have generally been flexible and not clearly defined. The information sharing pattern between the Executive and Legislative Branch has been largely hit or miss in the past. With increases in systematic sharing between these two branches may come the necessity for formal guidelines to preserve the separation of powers.

Relationships Between Federal, State And Local Government

As long ago as April, 1968, an Intergovernmental Task Force on Information Systems in The Dynamics of Information Flow 8/ found that information systems then in use were not geared to provide reliable and easily accessible information. Further, the Task Force study revealed that (1) exchanging information quickly and economically among governments is often difficult; (2) information is often unreliable, and difficult to summarize and evaluate; (3) there is unnecessary duplication of systems dealing with similar kinds of information; (4) unreasonable and conflicting demands for information are sometimes placed upon the lower levels of government; (5) state and local governments are frustrated in attempts to develop coordinated, unified systems; and (6) scarce resources are being wasted unnecessarily. Among the factors impeding the development of an efficient flow of useful information were: (1) lack of strong, central coordination at all levels of government over the development and operation of internal information systems: (2) fragmentation of Federal grant-in-aid programs available to help State and local governments in the development and operation of

information systems; (3) lack of adequate coordination among separate Federal and State programs which impose requirements for socioeconomic data upon lower levels of government; and (4) lack of appropriate consultation by Federal and state agencies with lower levels of government prior to imposing requirements for information.

These same problems continue today, exacerbated by developments in information systems, their technology, and by other factors. For example, sharing of taxpayer information by Federal and state governments has recently been a subject of controversy because of concern over procedures for insuring confidentiality.

There exists great potential for new institutional arrangements for government. According to Daniel Bell, the United States has become a "national society" as a result of the revolution in communications and transportation. He notes that communications technology does not respect the boundaries of States, counties, and townships. He believes that society must create institutional structures to meet the new scales if it is to survive. The implication is that governmental boundaries and the organizational

entities which operate within them are not well equipped to function in this new environment and a reorganization of traditional governmental structures may be required. But despite the fact that different allocation of government responsibility is becoming increasingly possible, the Nation's ability to meet the needs of a "national society" must be viewed as less than hopeful in the face of some of the most strongly entrenched interests in the country. Confrontations in an Information Age will continue to pose serious problems and severely test concepts of federalism and traditional governmental relationships.

ISSUE 15 Evaluate The Political Social And Economic Implications Of Information Networks And Information Utilities

Background

Trends in data processing and telecommunications promise widespread future use of information networks which will provide a great variety of services to homes and businesses. These networks have increasingly been referred to as information utilities. This term not only provides a convenient expression for a broad range of concepts, but it also suggests many of the important public policy issues involved by implying a comparison with current public utilities (electricity, water, telephone).

The questions which are raised by information utilities touch upon every issue raised in this report. The information utility concept represents a point in the future where many of today's issues will meet. Thus, much of the material which follows will appear familiar to those who have read the previous discussion.

Information systems now abound in the public and private sectors in the United States and other parts of the world. Hence, the question is no longer whether or not we should have networks, but how we should establish them to maximize their effectiveness and efficiency in a manner which will insure their use for public good?

Networking can result in major enhancement of information flow and significant decrease in the per unit cost of information. Moreover, the aggregation of information resulting from networking increases the amount of information available to users, and, through the use of computers, increases the integration of that information with other information. Users can thus have easier and faster access to a greater quantity of information than would be possible from separate systems. Furthermore, the quality of information is enhanced since processing and sharing encourages the maintenance and accuracy of the most up-to-date information. Distance is no longer a significant cost factor in a network since it will cost little more to send messages thousands of miles than to send them short distances. Networking also limits the amount of

information collected by eliminating duplication; it provides savings in manpower and overhead.

The major contenders for achieving such utility status are located in both the regulated and the unregulated sectors of the economy. Major corporations which originated in the communications business, on the one hand, and major corporations which originated in the computer business, on the other, are both beginning to take on similar characteristics as the line between computers and communications blurs. The remaining role for smaller entities and for entrepreneurs is unclear. Users of information, including the general public, have a major interest in the outcome of these developments. Their ability to protect consumer interests can have significant impact on the shape of the utilities.

Discussion

There are an enormous number of possibilities which networks and the utility concept present. They also raise an enormous number of complex questions requiring answers that will affect individuals as citizens, consumers, and in other roles.

Among the possibilities seen by forecasters are the following:

- Rapid growth of many personalized information services that can effect present banking and shopping patterns, mobility of individuals and families, education and training, and locus of employment;
- A changed relationship between the individual and government - extensive polling of citizens through home voting systems, library and other services to the home via communications, electronic neighborhood and town meetings, levying of taxes on home communications by governmental units, and the liklihood of more regulations dealing with information availability and use;
- Reduction of some of the many governmental units that now exist by consolidation through use of the new communications and transportation technology;
- Jurisdictional battles between city, state and Federal Governments over authority and control of information networks, data banks, switching and interfacing between networks;
- Legal problems of an infinite variety: freedom of information, disclosure, access to computerized networks, anti-trust and monopoly, protection of intellectual property, licensing, rates, individual versus societal rights and needs, and transborder flows of data;

- Considerable friction between various groups in the private sector and between the private sector and the government with regard to access and dissemination of information in government data bases;

- Increased international ferment in such areas as control of dissemination of information, especially unwanted information being transferred from one country to another; tariffs and taxes on information imports; demands for inclusion in certain technical information systems; and information to further national foreign policy;

- Extension of demand by public service groups, and from groups in the private sector, who desire extention of FOIA to include access to machine-readable government data bases;

- Battles over the extent to which communications public carriers should be permitted to get into the data bank field in competition with entrepreneurs who have entered the field; and

- Difficulties in survival for conventional information services, such as libraries, the technical press, and other print-oriented fields.

Among the questions that are being asked are:

- How many middle men will be involved in the distribution chain from data base to ultimate user?

- How much redundancy in alternative information channels may be needed to prevent excessive monopoly?

- How will reasonable access by groups and individuals to the contents of data banks be assured?

- What pricing mechanism will be employed?

- To what extent can there be competition between regulated and non-regulated networks?

- What policies are needed to encourage compatability of network operations on a Federal, national and international basis?

- What actions are needed to ensure the involvement of users in the development and operation of information networks?

- Should we depend primarily on marketplace mechanisms to determine the need for information systems, or should we employ other measuring techniques, such as socio-economic needs, for certain kinds of information networks?

- How should we relate growth in cable television, with its two-way capability, to telephone, also a two-way technology?

- Can marketplace factors play a useful role in continuing or terminating services?

Overshadowing many of these questions is another: Under what circumstances should the Federal government create government information networks? An obvious answer would be that it would establish them only in those cases where they are needed but do not exist; where private entrepreneurs are not equipped to establish them; and where they are needed to further governmental missions and responsibilities. But determinations of whether these considerations apply to particular cases will be difficult.

There is the related question of making distinctions between the general public and different special publics for the purpose of making decisions about financing information systems. Thus, the public served by the following systems now in service is different in every case: the Postal Service, the Weather Service, the air controllers information service, seismic information services, space information system, earth resources technology satellite system (LANDSTAT), environmental quality information systems, Federal Information Centers (operated by GSA), and sport and fisheries information systems.

For many, all of these concerns are dwarfed by questions about the desirability of information systems that involve data about individuals, particularly in light of their potential for political and bureaucratic misuse. How can checks and balances be placed on governmental authority to prevent abuse of such system?

Information utilities are now being discussed and debated in academic circles and in professional societies. As these utilities move from the status of theory to reality, the questions they present will increasingly have to be faced by government policymakers. The answers reached will have a impact on the Information Age and the place of the individual in society.

Information systems are spreading throughout the public and private sectors of the United States and the world. The question is no longer whether or not we should have networks, but how we should establish them to maximize their effectiveness and efficiency in a manner which will insure their use for public good.

SUMMARY

The issues discussed in this Chapter are presenting immediate, practical problems for government policymakers. In each cluster of issues, the questions raised involve complex and difficult choices between competing values. Except in the case of Cluster V (which is future oriented), the time to prepare for these choices is fast disappearing.

Cluster I - GOVERNMENT INFORMATION: COLLECTION, TRANSFER AND DISSEMINATION - This cluster covers the Freedom of Information Act, the Privacy Act, and numerous other "housekeeping statutes." Far from being settled law, early experience with these statutes indicates that there are unresolved questions, flaws and contradictions, and practical problems of administration. The reports of the Federal Paperwork Commission and the Privacy Protection Study Commission could well trigger proposals which will encourage

a revision of the current statutory scheme. This would raise major policy problems for the Congress and the Executive Branch within a reasonably short time.

Cluster II - INFORMATION IN COMMERCE: A RESOURCE FOR PUBLIC GOOD AND PRIVATE GAIN - This cluster deals with information and its impact in commercial areas. It deals with information as a commodity and as an essential element in the production of goods and services. Among the matters touching on these issues, revision of the copyright law has been before Congress for several years, and could become law before the end of the year. While the current proposals address some Cluster II questions, they do not always do so in the context of coordinated or comprehensive copyright policy. For instance, one government agency is seeking to use revision to gain a copyright for a limited class of government publications in order to obtain relief from contradictory government pricing policies. Other issues are being delegated for further study to the Commission on

New Technological Uses of Copyrighted Works. Some issues which were delegated in this manner may be decided by Congress before that Commission can act. Other Cluster II issues may be before Congress within two years as the Privacy Protection Study Commission makes its recommendations, the White House Conference on Libraries is held, and other groups begin to devise proposals for the complex issues involving government information services, libraries, and private sector information activities.

Cluster III - THE INFORMATION BETWEEN TECHNOLOGY AND GOVERNMENT - The Consumer Communications Reform Act of 1976 could provide the vehicle for a great national debate on the nature and shape of our national information and communications infra-structure and on the advantages of competition and monopoly. Private interests in support and in opposition to the approach which the bill takes have begun to marshall resources for this legislative fight. Analysis of the impact of these proposals on behalf of the public interest

will also be needed. Indeed, some knowledgeable observers have speculated that a major revision of the Communications Act of 1934 may be in the offing. In another area, the Congress has begun to show renewed interest in the Brooks Bill, and some Member of Congress see this as renewed interest in the compatibility of information systems. Congress has also begun the process of taking another look at the problems of the Postal Service.

Cluster IV - INTERNATIONAL IMPLICATIONS OF INFORMATION POLICIES AND DEVELOPMENTS - In this cluster, the near-term questions are not as pressing as in other instances. Nevertheless, decisions concerning the form which U.S. information assistance for less developed countries take will be affected by activities of international organizations, such as the Organization for Economic and Community Development, which are presently making decisions without reference to the posture of our domestic information policies.

Cluster V - PREPARING FOR THE INFORMATION AGE - The issues in this cluster are of a more long-range nature. They involve policy questions that require preparation for the future. While they lack the immediacy of the problems cited in the first four issue clusters, they are the type which test whether government can move beyond a crisis management approach to allocate resources on a more farsighted basis.

CHAPTER III

RECOMMENDATIONS

"Government alone cannot be equal to the task of guiding a major transformation of society that is essentially a phase in the cultural evolution of the human species. But government is the only institution competent to mediate the critical task of reassessing priorities, of redefining goals, and of devising the means toward the creation of a material and intellectual environment in which all other social institutions can play their respective roles in the transition." 1/

Lynton K. Caldwell, 1975

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To debate whether there should be a national information policy is pointless. There will be such a policy. It will be the result of the answers to the many questions raised in Chapter II and the answers to other questions not yet foreseen. It will exist whether or not these answers are arrived at

consciously or unconsciously, by commission or omission, carefully or haphazardly, in a comprehensive or in a piecemeal fashion.

The observations in a recent government report on communications issues apply as well to the broader issues which are the subject here:

> In earlier times, the expansion of new technology was welcomed without too much concern for future impact. There was room to make up rules and develop policies on a case-by-case basis. Policy was often no more than an accumulation of regulatory decisions. But the quickening pace of technological advances in communications has now rendered the ad hoc method of policy formulation not only obsolete but dangerous. The conditions of today require cohesive planning for the future so that crises, such as those experienced in the energy field, can be anticipated and avoided. What is now needed in communications is a broad and enduring policy framework that will insure that the benefits of new technologies are effectively and expeditiously made available to the consuming public. 2/

The issue, therefore, is whether government will attempt to take a considered and coordinated approach in arriving at these answers. A key question is how to structure the policymaking process so that the country can begin to develop a national information policy that is comprehensive, sufficiently sensitive

to new technology, and responsive to the implications of the Information Age. This report recommends that the first step toward structuring that process is the establishment of a policy organization within the Executive Office of the President to provide coordination and articulate a rational framework for a national information policy.

The Need For A Unified Approach

Chapter II sets forth an issue agenda for the Information Age. But if attention to that agenda is to be meaningful, it must be sustained, be supported by adequate resources, and be backed by sufficient authority to allow a coordinated policymaking process to take shape.

Bringing together the threads of a national information policy in one policymaking location meets several needs:

(1) Information policy issues are interrelated so that actions taken in one area may impact others. Decisions directed at one specific

problem may have consequences for other problems. Thus, the rules for dissemination of government-held information (Issue 3) affect the private information industry (Issue 5). Changes in laws affecting copyright (Issue 4) and postal rates (Issue 8), publication of government documents (Issue 5), and legislation such as the Right of Privacy Act (Issues 2 and 6) and the Freedom of Information Act (Issue 3), all affect the usefulness and accessibility of information, though these changes may have been initially prompted by discrete considerations. As Professor Oettinger has said in speaking of information policy, "Everything is related to everything else." 3/ At present no unit of government has the authority to respond to that reality.

(2) Comprehensive attention to information policy issues provides the most efficient use of manpower and skills. A unified approach to these issues will permit the development of strong and sustained policy skills, take maximum advantage of related experiences, minimize duplication, and

enhance the processes of coordination and policy development. In this regard, it is interesting to note that information policy is increasingly seen as a distinct academic discipline. The issues outlined in this report are, with varying degrees of emphasis, the subject of programs in several major universities. Numerous conferences organized by private sector groups in recent years have made information issues the theme of their program, even when the groups came from different places in the information sector. The general perception that these issues should be treated together is bringing about the development of approaches yielding cross-cutting skills which could benefit the Executive Branch.

(3) An organizational structure which has high visibility and adequate authority could prevent information concerns from being compromised and traded away for other concerns at the agency level (below the range of public visibility), which has often been the case in the past. This can probably be accomplished without changes in the statutory authority of existing agencies.

Organizational Alternatives

From time to time, institutional reorganizations have been advanced to provide better focus for some of the principal issues outlined in this report. One which has received considerable attention is the proposal for the creation of a Department of Communications. The limitations suggested by this name, it should be noted, narrow the broad focus for which this report argues. Therefore, for purposes of this discussion, it is assumed that any department would not take a broad policy approach.

One model which is often advanced is that based upon the Department of Transportation (DOT). It is particularly appropriate in the sense that, in addition to serving as the lead agency for the Executive Branch on transportation policy, DOT also co-exists with independent regulatory agencies (the Interstate Commerce

Commission, the Federal Maritime Commission, and the Civil Aeronautics Board). Presumably a Department of Communications would co-exist with the Federal Communications Commission.

While such a Department might be appropriate at some future date, its establishment at this time would be premature. The departmental option entails a commitment beyond the size and scope needed at this time. Indeed, the policy analysis and groundwork which would warrant such a commitment has not yet been completed.

Other proposals have called for an independent agency to undertake the task of policy coordination with respect to information and communications issues. Those who prefer such a course stress the need to insulate those functions from partisan activity. While this is a worthy goal, such independence exacerbates an already prevalant problem in government policy formulation - the absence of accountability. At least to the extent that policy formulation involves establishing positions for the Executive Branch, the authority of the President should not be diluted. A President's

ability to provide leadership and obtain a unified agency approach depends on clear lines of responsibility. It has been demonstrated that adequate checks and balances exist to cope with the possible misuse of authority. This is particularly true, as is the case here, where policy functions and not adjudicatory proceedings are involved.

Office of Information Policy

A national information policy is realizable through creation of an external committee and advisory structure and by a reallocation of resources within the Executive Office of the President. Financial and staff resource requirements to achieve this objective would be modest.

The principal mechanism for meeting the need for a unified approach to develop a national information policy should be the establishment of an Office of Information Policy (OIP) in the Executive Office of the President. This could be accomplished by structuring a new institutional entity within the Executive Office of the President or by refocussing and expanding responsibilities within any of several existing Executive Office of the President entities. The former would involve a larger investment of resources but would give impetus to the broadest focus on the critical issues. The latter would maximize use of existing expertise and experience and avoid increasing the size of the Executive Office.

Subject to the authority and control of the President, such an Office would perform the following types of general functions:

(1) Serve as the President's principal advisor on matters of information policy;

(2) Provide leadership for the Executive Branch through the initiation of programs of public benefit;

(3) Provide a structural framework for the resolution of competing interests and the balancing of competing values in the course of developing policies on behalf of the Executive Branch;

(4) Resolve conflicts between Federal agencies over policies for the Federal government and other sectors;

(5) Establish and refine priorities for dealing with issues of information policy;

(6) Develop technical and policy expertise with regard to information policy issues, contribute

to the growth of a conceptual framework for dealing with these issues, and monitor developments relating to them;

(7) Provide a focal point for both the public and the private sector where proposals and problems can receive consideration;

(8) Develop recommendations for such further organizational changes as might be required over time and, where appropriate, work with the Congress to effect such changes; and,

(9) Provide a central location for the receipt of the reports of temporary study commissions dealing with information policy and, where appropriate, act on behalf of the Executive Branch concerning them.

Placing of the policy machinery in the Executive Office of the President is appropriate given the limitations which exist on the power of the Executive Branch to respond unilaterally to the issues of information policy raised in this Report.

These issues are subject to the Constitutionally shared power between the Legislative and Executive Branches, and to a large extent have been historically divided among and between the two branches of government in a way that makes a fully coordinated approach especially difficult.

The degree to which Congress is already involved is apparent from the existing statutory schemes and potential legislative actions associated with each of the issue clusters. In other ways, the Congress has become uniquely involved in information policy questions. For example, both the Government Printing Office and the Copyright Office (within the Library of Congress) are part of the Legislative Branch and beyond the coordinating power of the Executive. The independence of FCC authority has the effect of isolating decisions from both Congress and the Executive Branch. Thus, cooperative arrangements will be necessary for policy development in almost all of these issue areas.

Before anything more is done, the Executive Branch needs to set its own activities and policy preferences in order. By establishing, at a sufficiently high level of authority, the means by which unified policies can be adequately considered and formulated, the Executive Branch can place itself in a position to provide leadership. This can best be done, given the importance of the issues and their government-wide effects, from within the Executive Office of the President.

Evolution of an Office

While the creation of a new office within the Executive Office of the President is one possible approach, such an office might also evolve out of the existing staff structures. The Office of Information Policy could conceivably be established as part of the Domestic Council or as part of the Office of Management and Budget. Another viable alternative for establishment of the Office could be through the Office of Telecommunications Policy.

When, in 1970, the Office of Telecommunications Policy was established pursuant to Presidential Reorganization Plan No. 1, a number of roles were envisioned for the new Office: to serve as the President's principal advisor on telecommunications policy; to help formulate government policies concerning a wide range of domestic and international telecommunication issues; and, to help develop plans and programs which take full advantage of the Nation's technological capabilities. The Presidential message accompanying the Plan noted that the speed of economic and technological advance in our time meant that new questions concerning communications are constantly arising, questions on which the government must be well informed and well advised.

In addition to its policy responsibilities vis-a-vis important telecommunications issues, OTP also reviews and coordinates Federal telecommunications planning procurement and manages the assignment of all Federal government radio frequencies. Executive Order 11556 of September 4, 1970 delineates all of OTP's functions and is the basic reference used in defining the Office's

present mandate. The Office has a small professional staff but is supported by private contract research assistance and an operational unit within the Department of Commerce.

Much of the rationale and justification for the creation of the Office of Telecommunications Policy is similarly applicable to the constellation of issues outlined in this Report, through the substitution of the broader focus of information for telecommunications. Among other things, the Office of Telecommunications Policy's activities in connection with electronic fund transfers, with FEDNET and other Federal networking proposals, and its close working relationship with the Domestic Council Committee on the Right of Privacy, have all shown the possibilities of such an expanded framework.

The issues which the Office of Telecommunications Policy is currently focussing upon are in many ways an information policy agenda, although not nearly so broad as that outlined in Chapter II above. The activities and

concerns of any Office of Information Policy will, of course, be the result of the establishment of priorities based on public need and public demand. If properly organized, adequately supported, and thoroughly committed, the Office of Telecommunications Policy could undertake the broader agenda recommended by this Report.

Council on Information Policy

As an adjunct to the operations of the Office of Information Policy, it is further recommended that there be established an inter-agency council, chaired by the Director of the Office, and consisting of designated high level officials in each agency. This body could be organized independently of the Domestic Council or as one of its committees.

The Council itself would meet only occasionally and then to serve as a forum in which government-

wide problems could be aired. The Council and its members would serve as a framework for the organization of subcommittees and task forces to deal with specific problem areas. The members of such task forces might include the agency representatives; more frequently they would be drawn from among agency people with specific expertise.

Advisory Committee

An Advisory Committee should be established to assist the Office in the formulation of policy and should provide a medium of two way exchange between it and the private sector, state and local government interests who are concerned with information policy matters and the academic and professional disciplines which are active in these areas. Such a committee could serve the worthwhile purpose of bringing together the often disparate elements of the information community. Through creative use of the power of appointment, the President could establish a committee with wide representation and great potential for fruitful inter-

action. The seeds of cooperation thus planted could result in the more effective marshalling of the considerable resources in the private, state and local sectors in the service of the nation.

Relationship With The Office Of Science And Technology Policy

The Congress has recently enacted legislation which re-establishes the position of Science Advisor to the President. The new Science Advisor (the Director of the Office of Science, Engineering, and Technology Policy) will be situated in the Executive Office of the President and provided with staff and membership on the Domestic Council. While the Science Advisor's mandate extends to the entire panoply of national scientific concerns, one specific area to which his attention is directed by the legislation is scientific information.

The subject of information policy, to the limited extent that is has been considered in prior years, has tended to be addressed in the context of scientific and technical information. This was the case during

the 1960's, when the focal point within the government for the discussion of information policy was the Committee on Scientific and Technical Information (COSATI), located within the predecessor to the office of the Science Advisor. This continues to be the case in the OECD where information policy questions are all structurally under the aegis of the Committee on Scientific and Technical Policy (CSTP). Indeed, because of this history, the problems associated with scientific information have often crowded out other information policy problems, and have caused the narrower concern to receive the greater attention.

The reach of the information policy questions which now confront the government make such questions too broad to be the exclusive concern of the Science Advisor. However, the Science Advisor should be the primary focus of policy with respect to scientific information. This reflects his specialized expertise and concerns. But the exercise of this function should be tempered with the awareness that decisions which are made regarding scientific information can impact upon the broader field of information policy generally.

Consequently, a close working relationship should be established between the Science Advisor and an Office of Information Policy with respect to such matters that might overlap.

Principles Of Information Policy

One of the most difficult tasks confronting public officials who will grapple with the issues outlined in this report is the formulation of principles to guide them in making decisions. The issues discussed in this report present some of the most complicated and difficult choices facing government. An agreed upon set of principles entails overcoming semantic difficulties balancing competing interests, and reconciling contradictory objectives in an area where the intangibility and newness of the subject matter leads itself to imprecision and misunderstanding.

Despite these difficulties, the following principles are offered, if only as a starting point for debate. While they are general and incomparable, they indicate some directions which principles of

information policy could take.

- Encourage access to information and information systems by all segments of society to meet the basic needs of people, to improve the quality of life and to enable the responsibilities of citizenship to be met.
- Safeguard the use of personal information about individuals and protect their right to personal privacy.
- Encourage systems that foster the creation and dissemination of knowledge.
- Maintain adequate control over the power information provides to government either through checks and balances, through diffusion of control, through decentralization, through Federal/state consortiums, or by other means.
- Encourage efficient resource allocation in the development of introduction systems and efficiency in their use through consistency in standards, practices and procedures, and through encouraging quality and accuracy.
- Maintain pluralism in information systems and strengthen the private sector so that, through competition, innovation can be encouraged.
- Adopt rules which will have some permanence and general applicability so that the private sector will be encouraged to invest in new systems and methods.

FOOTNOTES

Chapter I - Statement of the Problem

1/ Herman Kahn in an interview by Edward Jay Epstein, "Good News from Mr. Bad News," New York Magazine (August 9, 1976) pp. 34-44.

2/ National Commission on Libraries and Information Science, Toward a National Program for Library and Information Services: Goals for Action, Washington, D.C.: Government Printing Office, 1975, pp. 31-35.

3/ Conference Board, Inc., Information Technology: Some Critical Implications for Decision Makers, New York, 1972, p. 193.

4/ Daniel Bell, "The Post-Industrial Society: A Speculative View," in Scientific Progress and Human Values (Hutchings, Edward and Hutchings, Elizabeth, eds.), New York: American Elsevier Publishing, 1967; see also Daniel Bell, Coming of Post-Industrial Society: A Venture in Social Forecasting, New York: Basic Books, 1973; The Coming of Post-Industrial Society, New York: Basic Books, 1976.

5/ Peter Drucker, The Age of Discontinuity, New York: Harper and Row, 1969, p. 263.

6/ Prepared by the staff of the Domestic Council Committee on the Right of Privacy.

7/ Anthony G. Oettinger, Remarks at Roundtable on Privacy and Information Policy, Washington, D.C., September 7-9, 1975.

8/ 5 U.S.C. 552.

9/ Conference Report 94-1441.

10/ S. 3076, introduced on March 4, 1976.

Chapter II - Major Information Policy Issues

Introduction

1/ John Diebold, "The Evolving Role of Business Information," Address in New York University Key Issues Lecture Series, cited in Computer-world (February 16, 1976).

Issue Cluster I

1/ Hearings Before the Subcommittee on Oversight Procedures and the Subcommittee on Reports, Accounting, and Management of the Senate Committee on Government Operations (94th Congress, 1st Session) on S. 998, S. 2132, and S. 2443, October 10, 1975. Hereafter, Paperwork Hearings.

2/ Office of Management and Budget, Federal Personal Data Systems Subject to the Privacy Act of 1974, First Annual Report to the President, 1975, p. 2.

3/ National Bureau of Standards, Information Technology Division, Computers in the Federal Government, June, 1976.

4/ U.S. Constitution Art. II, Section 3.

5/ Estimate prepared by the Congressional Research Service for the Paperwork Hearings.

6/ 44 U.S.C. 3501

7/ 44 U.S.C. 3503.

8/ 44 U.S.C. 3509 and see OMB Circular A-40.

9/ 44 U.S.C. 3512.

10/ Interview with Roy Lowry, OMB Clearance Officer, Washington, D.C. August 3, 1976.

11/ Lowry interview.

12/ Paperwork Hearings, Testimony of Fernando Oaxaca, Associate Director for Management, OMB.

13/ Paperwork Hearings, Testimony of Victor L. Lowe, General Government Divison, GAO.

14/ See A.O. Smith v. FTC, 396 F. Supp. 1125 (D.C. Del. 1975).

15/ 5 U.S.C. 552a (e)(1).

16/ 5 U.S.C. 552a (e)(7)

17/ 5 U.S.C. 552a (e)(2).

18/ 5 U.S.C. 552a (e)(3).

19/ 44 U.S.C. 3501 (3)(a), P.L. 93-556 (December 27, 1974).

20/ Paperwork Hearings, Testimony of Fernando Oaxaca, Associate Director for Management, OMB.

21/ The legality of this standard has been upheld by the courts. See Gruman Aircraft Engineering v. Renegotiation Board, 452 F.2d 578 (D.C. Cir. 1970).

22/ Lewis M. Branscomb, Address Before the American Association for the Advancement of Science, Boston, Massachusetts, February 19, 1976.

23/ National Science and Technology Policy, Organization, and Priorities Act of 1976, P.L. 94-282 (May 11, 1976).

24/ 40 U.S.C. 759, P.L. 89-306 (October 30, 1965).

25/ Federal Personal Data Systems Subject to the Privacy Act of 1974, p. 3.

26/ Ibid., p. 4.

27/ 5 U.S.C. 552a (e)(5).

28/ 5 U.S.C. 552a (e)(9), (10).

29/ 5 U.S.C. 552a (b)(1).

30/ 5 U.S.C. 552a (b)(2).

31/ 5 U.S.C. 552a (b)(3).

32/ 5 U.S.C. 552a (b)(4), (6), (7).

33/ 5 U.S.C. 552a (c)(1).

34/ Privacy Journal (December 1, 1975); Computerworld (October 1, 1975).

35/ 5 U.S.C. 552a (a)(7).

36/ 5 U.S.C. 552a Section 7.

37/ Office of the Attorney General, Memorandum to the Heads of all Executive Departments and Agencies on Implementation of the Privacy Act of 1974 - Routine Uses of Information, June 5, 1975.

38/ 5 U.S.C. 551-559, et. seq., P.L. 79-404 (June 6, 1972).

39/ P.L. 92-463 (October 6, 1972).

40/ 5 U.S.C. 552 (b) (1)-(9).

41/ Cohen, "New Information Law Gets Heavy Use from Public, Business," National Journal Reports (July 5, 1975) pp. 985-982.

42/ Interview with William H. Taft, IV, General Counsel, HEW, Washington, D.C., August 10, 1976.

43/ 5 U.S.C. 552 (b)(4).

44/ Rural Housing Alliance v. U.S. Department of Agriculture, 498 F.2d 73 (D.C. Cir. 1974).

45/ Brockway v. Department of Air Force, 370 F. Supp. 738 (D.C. Iowa 1974).

46/ Benson v. General Services Administration, 289 F. Supp. 590 (D.C. Wash. 1968), affirmed 415 F.2d 878.

47/ "Use, Abuse of Freedom of Information Act," Washington Post (July 27, 1976).

48/ Ibid.

49/ See also OMB Circular A-25.

50/ 5 U.S.C. 552a (a)(4).

Issue Cluster II

1/ Martin Greenberger, ed., Computers, Communications, and the Public Interest, Baltimore: Johns Hopkins Press, 1971, p. 170.

2/ Nicholas L. Henry, "Copyright, Public Policy and Information Technology," Science, Vol. 186 (December 13, 1974) p. 384.

3/ These are among the many complex issues being considered by the National Commission on New Technological Uses of Copyrighted Works, established by P.L. 93-573 (December 31, 1976).

4/ Greenberger, p. 199.

5/ Paul Zurkowski, Remarks at Information Industry Conference, 1975.

6/ H.R. 1984, 94th Congress, 1st Session.

7/ Statistical Abstract of the United States, 1975, pp. 467-470.

8/ Ibid., pp. 470-475.

9/ Ibid., p. 475; also Mondell, "Credit Card Use in the United States," University of Michigan (unpublished monograph).

10/ 15 U.S.C. 1681a.

11/ Alan Westin and Michael Baker, Data Banks in a Free Society, New York: Quadrangle Press, 1972 p. 131.

12/ Westin, p. 141.

13/ "Conn to Examine MIB," New York Journal of Commerce (July 24, 1974).

14/ "Medical Intimacies of Thousands on File," Danville Virginia Bee (April 24, 1974).

15/ see Westin, Computers, Health Records, and Citizen Rights, Report of the Project on Medical Records and Citizen Rights, Sponsored by the National Bureau of Standards, July, 1975.

16/ Family Educational Rights and Privacy Act of 1974, 20 U.S.C. 1232 a (1975).

17/ ADAPSO, DATA, Vol. 6, No. 2.

18/ Hearings Before the Senate Judiciary Committee on S. 354, "To Provide for No-Fault Insurance," December 4,5,6,12, 1973, January 24, 29,30,31, 1974, and February 5,6,7, 1974.

19/ Statement of insurance company officials under the auspices of the American Life Insurance Association and the Health Insurance Association of America before the Privacy Protection Study Commission, May 19, 1976.

20/ New State Ice Co. v. Liebmann, 285 U.S. 262 (1932).

21/ 350 U.S. 497 (1956).

22/ Goldstein v. California, 412 U.S. 546 (1973).

Issue Cluster III

1/ 40 U.S.C. 759, P.L. 89-306 (October 30, 1965).

2/ 47 U.S.C. 151 et. seq.

3/ Use of Carterfone Device in Message Toll Service 13 FCC 2d 420 (1968); Microwave Communications, Inc., 18 FCC 2d 953 (1969); Specialized Carrier Inquiry, 29 FCC 2d 870 (1971); Establishment of Communications-Satellite Facilities by Non-Government Entities, 35 FCC 2d 844 (1972).

4/ Federal Council for Science and Technology, Panel on the Legal Aspects of Information Systems, Legal Aspects of Computerized Information Systems, Report to the Committee on Scientific and Technical Information, Chapter V., 1973.

5/ S. 1392, introduced March 23, 1976, and H.R. 12323, introduced March 4, 1976, 94th Congress.

6/ Gene D. Hodge, "The Future Role of the United States Postal Service: Telecommunications Leader or Conveyor of Materials?," Paper presented at the Electronic Mail Session of the Airlie House Telecommunications Policy Research Conference, April, 1976, p. 1.

7/ 39 U.S.C. 601-606, 18 U.S.C. 1693-1699, 1724.

Issue Cluster IV

1/ "Progress Toward International Data Networks," EDP Analyzer, Vol. 13 (January, 1975).

2/ Dr. Betsy Ancker-Johnson, "Computer-Telecommunications: A Crossroad to Global Benefits," Remarks at the OECD Conference on Computers/Telecommunications Policy, Paris, February 4, 1975.

3/ R. E. Butler, "International Cooperation and Regulation-Foundations for Development," Address at ICCC Conference, Stockholm, Sweden, August 12-14, 1974.

4/ William H. Reed, "The High and Low Politics of Telecommunications," Harvard University Program of Information Technologies and Public Policy, Cambridge, Massachusetts, Publication P-76-3 (February, 1976).

5/ Japan Computer Usage Development Institute, The Information Society: A Year 2000 Japanese National Goal, Computer White Paper, 1970 ed., Chiyodaku, Tokyo, Japan, 1970.

6/ Alan Gotlieb et al., "The Transborder Transfer of Information by Communications and Computer Systems: Issues and Approaches to Guiding Principles," American Journal of International Law Vol. 68, No.2 (April, 1974) p. 227.

7/ Organisation for Economic Co-operaion and Development, 10 Policy Issues in Data Protection and Privacy, Informatics Studies, No. 10 Paris, 1976.

8/ Burt Nanus et al., The Social Implications of the Use of Computers Across National Boundaries, Montvale, New Jersey: AFIPS Press, 1973.

9/ Application of Computer Science and Technology to Development, Report of the Secretary General, United Nations Economic and Social Council (January 2, 1976).

10/ C. Dalfen, International Factors, A Study for the Privacy and Computers Task Force of the Departments of Communications/Department of Justice, Ottawa, 1972.

11/ Price Waterhouse Associates, DATA COM 76, Prepared for the Federal Department of Communications, Ottawa, 1976.

12/ Alan Gotlieb and Kenneth Katz, "Issues Associated with the Transborder Flow of Personal Information," Computers and Law (Winter, 1976).

13/ See H.R. 1984, 94th Congress, 1st Session, Section 4(a)(6).

14/ Congressman Barry M. Goldwater, Jr., Address to the International Computer Communications Conference, Toronto, Canada, August 5, 1976.

15/ Application of Computer Science and Technology to Development, Report of the Secretary General, United Nations Economic and Social Council, January 2, 1976.

16/ Honorable Henry A. Kissinger, Secretary of State, "Expanding Cooperation of Global Economic Development," Address to UNCTAD IV Conference, Nairobi, Kenya, May 6, 1976.

17/ Intergovernmental Bureau of Informatics, An Introduction to Informatics, Rome, Italy.

Issue Cluster V

1/ Edwin B. Parker, "Social Implications of Computer/Telecommunications Systems," Institute for Social Research, Stanford, California February, 1975, p. 8.

2/ Figure I Source: Marc U. Porat, "The Information Sector: Definition and Measurement," Paper Presented to the Association for the Advancement of Science Conference: "America: The First Information Society", Boston, Massachusetts, 23 February 1976.

3/ Figure II Source: Marc U. Porat, Office of Telecommunications, Department of Commerce, Washington, D.C., 1976.

4/ Meadows, Donelle H. et al., The Limits to Growth 2nd ed. rev., New York: New American Library, 1974.

5/ Edwin B. Parker, "Social Implications of Computer/Telecommunications Systems," Institute for Social Research, Stanford, California, February, 1975, p. 8.

6/ Dubbed the "Paul Principle" by Paul Armer in "The Individual: His Privacy, Self-Image and Obsolescence," in Management of Information and Knowledge, A Compilation of Papers Prepared for the 11th Meeting of the Panel on Science and Technology of the House Committee on Science and Astronautics, Washington, D.C.: Government Printing Office, 1970.

7/ M. Cooley, "The Knowledge Worker in the 1980's," Address Before the Plenary Session of the Diebold Research Program, Amsterdam, 1975.

8/ Intergovernmental Task Force on Information Systems, The Dynamics of Information Flow, Washington, D.C.: April, 1968.

Chapter III - Recommendations

1/ Lynton K. Caldwell, Managing the Transition to Post-Industrial Society," Public Administration Review (November/December, 1975) pp. 567-572 passim.

2/ Office of Telecommunications Policy, Executive Office of the President, Activities and Programs: 1975-1976, p.1.

3/ Anthony Oettinger, Keynote Address, Annual Meeting of American Society for Information Societies, Boston, October, 1975.

BIBLIOGRAPHY

Aines, Andrew and Day, Melvin S. "National Planning of Information Services." in Annual Review of Information Science and Technology. (Cuadra, Carlos and Luke, Ann, eds.). Washington, D.C.: American Society for Information Science. 1975.

Aislabie, C. "The Economic Efficiency of Information Producing Activities." The Economic Record. December, 1972.

Alchian, A.A. and Demetz, H. "The Property Rights Paradigm." Journal of Economic History. March, 1973.

Alternatives for Financing the Public Library. A Study Prepared for the National Commission on Libraries and Information Science. May, 1974 (OEC-0-73-7092).

American Libraries. "New Plan for NTIS?" Vol. 5. No. 6 (June) 1974.

American Society for Information Science. Proceedings of the 38th ASIS Annual Meeting. Boston, Massachusetts. October 26-30, 1975. Vol. 12. Washington, D.C.: American Society for Information Science. 1975.

Ancker-Johnson, Betty. "Computer-Telecommunications: A Crossroad to Global Benefits." Remarks at the Organisation for Economic Cooperation and Development Conference on Computers/Telecommunications Policy. Paris. 4 February 1975.

Application of Computer Science and Technology to Development. Report of the Secretary-General. United Nations Economic and Social Council. 2 January 1976.

Armer, Paul. Social Implications of the Computer Utility. Santa Monica, California: The Rand Corporation. November, 1965.

Armer, Paul. "The Individual: His Privacy, Self Image and Obsolescence." Computers and People. June, 1975.

Arrow, Kenneth J. The Limits of Organization. New York: W. W. Norton. 1974.

Arrow, Kenneth J. "The Economic Implications of Learning by Doing." Review of Economic Studies. Vol. 29. 1962.

Arrow, Kenneth J. "Economic Welfare and the Allocation of Resources for Invention." in The Rate and Direction of Inventive Activity: Economic and Social Factors. (National Bureau of Economic Research). Princeton: Princeton University Press. 1962.

Asimov, Isaac. "The Fourth Revolution." The Saturday Review. 24 October 1970.

Becker, Joseph. The First Book of Information Science U.S. Energy Research and Development Administration Office of Public Affairs. Washington, D.C. 1973.

Beer, Stafford. "Managing Modern Complexity." in The Management of Information and Knowledge. (U.S. Congress. House. Committee on Science and Astronautics). Washington, D.C.: Government Printing Office. 1970.

Bell, Daniel, ed. Toward the Year 2000. Boston: Beacon Press. 1969.

Bell, Daniel. Coming of Post-Industrial Society: A Venture in Social Forecasting. New York: Basic Books. 1973.

Bell, Daniel. The Coming of Post-Industrial Society. New York: Basic Books. 1976.

Bell, Daniel. The Cultural Contradictions of Capitalism. New York: Basic Books. 1976.

Bell, Daniel. "The Post-Industrial Society: A Speculative View." Scientific Progress and Human Values (Hutchings, Edward and Hutchings, Elizabeth, eds.). New York: American Elsevier Publishing. 1967.

Bell, Daniel. "Toward a National Policy in Information." Keynote Address. American Society for Information Science. Boston, Massachusetts. 25 October 1975.

Benjamin, Curtis G. "Copyright and Government: A Sea of Troublesome Questions." Library Journal. Vol. 91. No. 4 (February 15) 1976.

Bernstein, Frank and Polishuk, Paul, eds. "Productivity and Information." Proceedings and Additional Material from an Engineering Foundation Conference. July 28-August 2, 1974. (to be published).

Bernstein, Jeremy. "When the Computer Procreates." New York Times Magazine. 15 February 1976.

Boulding, Kenneth E. A Primer on Social Dynamics. New York: Free Press. 1970.

Bowes, T.L. "Patents and the Public Interest." American Bar Association Journal. Vol. 61 December, 1975.

Boyd, Joseph A. "Technology: Its Impact on the 1980's." Signal. May/June, 1976.

Branscomb, Lewis M. Scientific Communications and the Advancement of Science. American Association for the Advancement of Science. Boston, Massachusetts. 19 February 1976.

Bulletin of the American Society for Information Science. Vol. 1. No. 3 (October) 1974.

Bulletin of the American Society for Information Science. Vol. 1. No. 10 (May) 1975.

Bush, George P., ed. Technology and Copyright: Annotated Bibliography and Source Materials. Mr. Airy: Lomond Systems, Inc. 1972.

The Cabinent Committee on Cable Communications. Cable. Report to the President. Clay T. Whitehead, Chairman. 1974.

Carroll, James D. and Henry, Nicholas L., eds. "A Symposium: Knowledge Management." Public Administration Review. November/December, 1975.

Chartrand, Robert L. Computers and Political Campaigning. Washington: Spartan Books. 1972.

Chartrand, Robert L. Computers in the Service of Society. Pergamon. 1972.

Conference Board, Inc. Information Technology: Some Critical Implications for Decision Makers. Report 537. New York, 1972.

Conference Board, Inc. Information Technology: Initiatives for Today - Decisions that Cannot Wait. Report 577. New York, 1972.

Cooley, M. "The Knowledge Worker in the 1980's." Address to Plenary Session of the Diebold Research Program. Amsterdam. 1975.

Copyright and Reprography. Freedom of Information Center Report No. 351. School of Journalism, University of Missouri at Columbia. March, 1976

Cordtz, Dan. "The Coming Shake-up in Telecommunications." Fortune. April, 1970.

Cuadra, Carlos A. and Luke, Ann W., eds. Annual Review of Information Science and Technology. Vol. 9 and 10. Washington, D.C.: American Society for Information Science. 1974, 1975.

Dalfen, C. International Factors. A Study for the Privacy and Computers Task Force. Department of Communications/Department of Justice. Ottawa, 1972.

Diebold, John. Man and the Computer: Technology as an Agent of Social Change. New York: Frederick A. Praeger. 1969.

Diebold, John, ed. The World of the Computer. New York: Random House. 1973.

Dreyfus, Hubert L. What Computers Can't Do: A Critique of Artificial Reason. New York: Harper and Row. 1972.

Drucker, Peter F. The Age of Discontinuity. New York: Harper and Row. 1969.

Drucker, Peter F. Technology, Management and Society. New York: Harper and Row. 1970.

Durr, W. T. "Information and Power: Information as a Key in the Political Process." Baltimore Region Institutional Studies Center. University of Baltimore. Baltimore, Maryland. 15 June 1976.

EDP Analyzer. "Progress Toward International Data Networks." Vol. 13. No. 1 (January) 1975.

Eger, John. Statement Before the Subcommittee on Communications of the Interstate and Foreign Commerce Committee. U.S. House of Representatives. 10 November 1975.

Etzioni, Amitai. Social Problems. New York: Prentice Hall. 1976.

Etzioni, Amitai. Technological Shortcuts to Social Change. Russell Sage. 1972.

Federal Council for Science and Technology. Annual Report on Government Patent Policy. Washington, D.C.: U.S. Government Printing Office. 1968.

Federal Council for Science and Technology. Committee on Scientific and Technical Information. National Document Handling Systems for Science and Technology. System Development Corporation. New York: Wiley. 1967.

Federal Council for Science and Technology. Panel on the Legal Aspects of Information Systems. Legal Aspects of Computerized Information Systems. Report to the Committee on Scientific and Technical Information of the Federal Council on Science and Technology. John Farmakides, Chairman. 1973.

Federal Management of Scientific and Technical Information Activities: The Role of the National Science Foundation. Prepared for the Special Subcommittee on Labor and Public Welfare. United States Senate (94th Congress, 1st Session). Washington, D.C.: Government Printing Office. July, 1976.

Gotlieb, Allan and Katz, Kenneth. "Issues Associated With the Transborder Flow of Personal Information." Computers and the Law. Winter, 1976.

Gotlieb, Allan, et al. "The Transborder Transfer of Information by Communications and Computer Systems: Issues and Approaches to Guiding Principles." American Journal of International Law. Vol. 68. No. 2 (April) 1974.

Greenawalt, Kent. Legal Protections of Privacy. Final Report to the Office of Telecommunications Policy. Executive Office of the President. Washington, D.C. 1975.

Greenberger, Martin, ed. Computers, Communications, and the Public Interest. Baltimore: Johns Hopkins. 1970.

Greenberger, Martin, et al., eds. Networks for Research and Education: Sharing of Computer and Information Resources Nationwide. Cambridge, Massachusetts: M.I.T. Press. 1974.

Harper, R. E. "Patent Reform: A Rational Alternative." Journal of the Patent Office Society. Vol. 57 June, 1975.

Hattery, Lowell H., ed. Technological Change in Printing And Publishing. Hayden. 1973.

Havrilesky, Thomas M. "Information and Economic Analysis." Annals of the American Academy. Vol. 412. March, 1974.

Heilbroner, Robert L. An Inquiry Into the Human Prospect. New York: W. W. Norton, Inc. 1974.

Henderson, Carter. "Futurism: A Peephole Through the Fence into Tomorrow." National Observer. 10 January 1976.

Henderson, Hazel. "Information and the New Movements for Citizen Participation." Annals of the American Association for Political and Social Science. Vol. 412. March, 1974.

Henry, Nicholas L. "Copyright: Its Adequacy in Technological Societies." Science. Vol. 186. 13 December 1976.

Henry, Nicholas L. "Copyright, Public Policy, and Information Technology." Science. Vol. 183. 1 February 1974.

Henry, Nicholas L. "Knowledge Management: A New Concern for Public Administration." Public Administration Review. May/June, 1974.

Hirshleifer, Jack. "The Private and Social Value of Information and the Reward to Inventive Activity." American Economic Review. Vol. 61. September, 1971.

Hirshleifer, Jack. "Where are We in the Theory of Information?" American Economic Review. Vol. 62 No. 2 (May) 1972.

Hodge, Gene, D. "The Future Role of the United States Postal Service: Telecommunications Leader or Conveyor of Materials?" Paper Presented at the Electronic Mail Session of the 1976 Airlie House Telecommunications Policy Research Conference. 1976.

Hondius, Frits, W. Emerging Data Protection in Europe. New York: American Elsevier Publishing Company. 1975.

Intergovernmental Task Force on Information Systems. The Dynamics of Information Flow. Washington, D.C. 1968.

Japan Computer Usage Development Institute. The Information Society: A Year 2000 Japanese National Goal. Computer White Paper. 1970 edition. Kasumigaseki Building, 3-2-5 Kasumigaseki, Chiyodaku, Tokyo, Japan. 1970.

Jones, Mary Gardiner. "Computerized Information Systems as the Books, Magazines, and Journals of the Future." Bulletin of the American Society for Information Science. Vol. 1. No. 10 (May) 1975.

Joyce, Charles C., Jr. "Policy Goals and Government Action." Remarks to EASCON 75: "Technology for Change." Washington, D.C. 29 September 1975.

Khan, Herman. "Two Characteristic Current Views on Technological and Economic Growth." Futurology. No. 7. Winter, 1976.

Kitner, Earl W. and Lahr, Jack L. An Intellectual Property Law Primer. New York: MacMillan. 1975.

Kozmetsky, George. "Education as an Information System." in The Management of Information and Knowledge. (U.S. Congress. House. Committee on Science and Astronautics). Washington, D.C.: Government Printing Office. 1970.

Lasswell, Harold. "Policy Problems of a Data-Rich Civilization." International Federation for Documentation, 31st Meeting, and Congress, Proceedings of the 1965 Congress. Washington, D.C. October 7-16, 1965.

Leininger, Joseph E. and Bruce Gilchrist, eds. Computers, Society and Law: The Role of Legal Education. Proceedings of the AFIPS/Stanford Conference. June 25-27, 1973. New Jersey: AFIPS Press. 1973.

Library and Information Service Needs of the Nation. Proceedings of a Conference on the Needs of Occupational, Ethnic, and other Groups in the United States. Washington, D.C.: Government Printing Office. 1974.

Arthur D. Little, Inc. Telecommunications and Society, 1976-1991. Report to the Office of Telecommunications Policy, Office of the President. 26 June 1976 (TP6AC 017).

Arthur D. Little, Inc. The Consequences of Electronic Funds Transfer. Prepared for the National Science Foundation. June, 1975 (NSF-C844).

Lowe, Robert M. "Information Industry." A Paper Presented to the Engineering Foundation Conference. July 28-August 2, 1974.

McCracken, Daniel D. et al. "A Problem List of Issues Concerning Computers and Public Policy." Communications of the Association for Computing Machinery. May, 1975.

McKinsey & Company, Inc. Assessing Organizational Alternatives for the Office of Telecommunications Policy. Draft Report to the Office of Telecommunications Policy. Executive Office of the President. April, 1976.

Machlup, Fritz. The Production and Distribution of Information in the United States. Princeton: Princeton University. 1962.

Making Technical Information More Useful - The Management of a Vital National Resource. Report to the Chairman of the Federal Council for Science and Technology. Martin Greenberger, Chairman. June, 1972.

Marshak, J. "Economics of Information Systems." in Frontiers of Quantitive Economics. (M.D. Intriligator, ed.). Amsterdam: North-Holland Press. 1972.

Marshall, John M. "Private Incentives and Public Information." American Economic Review. Vol.64. June, 1974.

Martin, James and Norman, Adrian. The Computerized Society. Englewood Cliffs, New Jersey: Prentice Hall, Inc. 1970.

Mathison, Stuart and Walker, Philip. "Regulatory and Economic Issues in Computer Communications." Computer Communication (Green, Paul and Lucky, Robert, ed.). New York: The Institute of Electrical and Electronic Engineers. 1975.

Meadows, Donelle H. et al. The Limits to Growth. 2nd ed. rev. New York: New American Library. 1974.

Michael, Donald N., ed. The Future Society. 2nd ed. Transaction Books. 1973.

Michael, Donald N. The Unprepared Society: Planning for a Precarious Future. New York: Basic Books. 1968.

Michael, Donald N. "Some Long-Range Implications of Computer Technology for Human Behavior in Organizations." American Behavioral Scientist. Vol. 9. April, 1966.

Miller, Arthur R. The Assault on Privacy. Ann Arbor, Michigan: University of Michigan Press. 1971.

Morrison, Donald M. "What Hath Xerox Wrought." Time. 1 March 1976.

Nanus, Burt et al. The Social Implications of the Use of Computers Across National Boundaries. Montvale, New Jersey: American Federation of Information Processing Societies. 1973.

Nanus, Burt. "Information Science and the Future." Bulletin of the American Society for Information Science. March, 1976.

Nanus, Burt. "Managing the Fifth Information Revolution." Business Horizons. April, 1972.

National Academy of Sciences. Information Systems Panel, Computer Science and Engineering Board. Libraries and Information Technology: A National Systems Challenge. Report to the Council on Library Resources, Inc. Washington, D.C. 1972.

National Academy of Sciences. Scientific and Technical Communication - A Pressing National Problem and Recommendations for the Solution. Report of the Committee on Scientific and Technical Communication of the National Academy of Engineering. June, 1969.

National Bureau of Standards. Information Technology Division. Computers in the Government. Washington, D.C. June, 1976.

National Commission on Libraries and Information Science. Annual Report to the President and Congress. 1974/1975.

National Commission on Libraries and Information Science. Toward a National Program for Library and Information Services: Goals for Action. Washington, D.C.: Government Printing Office. 1975.

Nimmer, Melville B. Nimmer on Copyright. 2 Vols. New York: Matthew Bender. 1976.

Oettinger, Anthony G. Elements of Information Resources Policy: Library and Other Information Services. rev. ed. Report to the National Commission on Libraries and Information Science. Harvard University, Program on Information Technologies and Public Policy. 12 January 1976.

Oettinger, Anthony G. Run, Computer, Run: The Mythology of Educational Innovation. New York: Macmillan. 1971.

Oettinger, Anthony and Shapiro, Peter D. Information Industries in the United States. Harvard University Program on Information Technologies and Public Policy. May, 1975.

Office of Management and Budget. Federal Personal Data Systems Subject to the Privacy Act of 1974. First Annual Report to the President. Calendar Year 1975. 1976.

Office of Telecommunications Policy, Executive Office of the President. Activities and Programs: 1975-1976.

Organisation for Economic Co-operation and Development. 10 Policy Issues in Data Protection and Privacy. Proceedings of the OECD Seminar, June 24-26, 1974, Informatics Studies. No. 10. Paris. 1976.

Organisation for Economic Co-operation and Development. Information for a Changing Society - Some Policy Considerations. (Piganiol Report). Paris. 1971.

Orwell, George. 1984. New York: Harcourt Brace. 1949.

Owen, Bruce M. Telecommunications Policy Research. Report on the 1975 Conference Proceedings. Airlie Virginia. April 16-19, 1975.

Parker, Edwin B. "Assessment and Control of Communication Technology." Proceedings of International Symposium on Communication Technology, Impact and Policy. Annenberg School of Communications. Philadelphia, Pennsylvania. March 23-25, 1972.

Parker, Edwin B. "Networks for an Information Society." Bulletin of the American Society for Information Science. Vol. 2, No. 1 (June/July) 1975.

Parker, Edwin B. "On-line Polling and Voting." in Planning Community Information Activities. (H. Sackman, B. Boehm, eds.) Montvale, New Jersey: AFIPS Press. 1972.

Parker, Edwin B. "Social Implications of Computer/Telecommunications Systems." Institute for Social Research. Stanford, California. February, 1975 (NSF Grant GJ-36392X).

Parker, Edwin B. and Dunn, Donald H. "Information Technology: Its Social Potential." Science. 30 June 1976.

Pennock, J. Roland and Chapman, John W., eds. Privacy. Nomos Series No. 13. New York: Atherton Press. 1971.

Phillips, Kevin P. Mediacracy. Garden City: Doubleday & Company, Inc. 1975.

Pierce, John R. "Communication and Man's Life." Bulletin of the American Society for Information Science. Vol. 2. No. 1 (June/July) 1975.

Pipe, Russell. Towards Central Government Computer Policies - Data Base Developments and International and International Dimensions. OECD Informatics Series. No. 5. Paris. 1972.

de Sola Pool, Ithiel. "The International Aspects of Computer Telecommunications." Paper Presented to the Organisation for Economic Cooperation and Development Conference on Computers/Telecommunications Policy. Paris. 4 February 1975.

de Sola Pool, Ithiel et al. "On the Design of Computer-Based Information Systems." Paper Issued by the Massachusetts Institute of Technology. Cambridge, Massachusetts. 1968.

de Sola Pool, Ithiel. Policy Choices for the Information Age. An Occasional Paper of the Aspen Institute's Program on Communications and Society. Washington, D.C. Seminar of February 19, 1976.

Porat, Marc U. "Defining the Information Sector." Bulletin of the American Society for Information Science. February, 1976.

Porat, Marc U. "The Information Sector: Definition and Measurement." Remarks to the American Association for the Advancement of Science Conference: "America: The First Information Society." Boston, Massachusetts. 23 February 1976.

President's Advisory Council on Executive Organization. A New Regulatory Framework. Report on Selected Independent Regulatory Agencies. Washington, D.C. Government Printing Office. January, 1971.

President's Science Advisory Committee. Improving the Availability of Scientific and Technical Information in the United States. Panel Report. W. O. Baker, Chairman. 7 December 1958.

President's Science Advisory Committee. Science, Government and Information: The Responsibilities of the Technical Community and the Government in the Transfer of Information. A. M. Weinberg, Chairman. 10 January 1963.

President's Task Force on Communications Policy. Final Report. Eugene V. Rostow, Chairman. 7 December 1968.

Price Waterhouse Associates. Data Com 76. Ottawa, 1976.

Rawls, John. A Theory of Justice. Cambridge, Massachusetts: Belknap Press. 1973.

Reed, William H. "The High and Low Politics of Telecommunications." Harvard University Program of Information Technologies and Public Policy. Publication P-76-3. Cambridge, Massachusetts. February, 1976.

Reich, Charles A., "The New Property." Yale Law Journal. Vol. 73. No. 5 (April) 1964.

Relyea, Harold C. "Opening Government to Public Scrutiny: A Decade of Federal Efforts." Public Administration Review. January/February, 1975.

Resources and Bibliographic Support for a Nationwide Library Program. Final Report to the National Commission on Libraries and Information Science. August, 1974.

Richardson, John M. "An 'Information Society' in Your Future." Remarks Before the Telecommunications Committee of the National Association of Manufacturers. Washington, D.C. 13 January 1976.

Richardson, John M. "Three Alternative Communications Futures." Remarks Before the Canadian Information Processing Society. Ottawa, Canada. 14 October 1976.

Rodgers, Quincy. "Toward a National Information Policy." Bulletin of the American Society for Information Science. January, 1976.

Rose, Charles G., III, Congressman. Keynote Speech. National Computer Conference. 9 June 1976.

Rule, James B. Value Choices in Electronic Funds Transfer. Prepared for the Office of Telecommunications Policy. Executive Office of the President. Washington, D.C.: Government Printing Office. 1975.

Sackman, Harold. Computers, System Science, and Evolving Society. New York: Wiley and Sons, Inc. 1967.

Sackman, Harold. Mass Information Utilities and Social Excellence. Princeton, New Jersey: Auerbach Publishers. 1971.

Sackman, Harold and Nie, Norman, eds. The Information Utility and Social Choice. Montvale, New Jersey: AFIPS Press. 1970.

Sackman, Harold and Boehm, Barry, eds. Planning Community Information Utilities Montvale, New Jersey: AFIPS Press. 1972.

Saracevic, Tefko. "Information Utilities: Evolution, State of the Art, Problems." Paper Presented at the Series, "Pandora and Prometheus: Emerging Struggle over Information Technology." Baltimore Region Institutional Studies Center. University of Baltimore. Baltimore, Maryland. March, 1975 (NSF Grant GN-36085).

Scientific and Technical Communications in the Government. Task Force Report to the President's Special Assistant for Science and Technology. J.H. Crawford, Chairman. April, 1962 (AD-299-545).

Second Supplementary Report of the Register of Copyrights on the General Revision of the U.S. Copyright Law: 1975 Revision Bill. October-December, 1975.

Shackle, G.S.L. "Decision: The Human Predicament." Annals of the American Academy of Political and Social Science. Vol. 412. March, 1974.

Shubik, Martin. "Information, Rationality, and Free Choice in a Future Democratic Society." Daedalus. Vol. 96. Summer, 1967.

Spence, A. Michael. "An Economist's View of Information." in Annual Review of Information Science and Technology. (Cuadra, Carlos and Luke, Ann, eds.). Vol. 9. Washington, D.C.: American Society for Information Science. 1974.

Stallings, C. Wayne. "Local Information Policy: Confidentiality and Public Access." Public Administration Review. May/June, 1974.

Task Force on Privacy and Computers. Privacy and Computers. Canadian Department of Justice/Department of Communications. Ottawa: Information Canada. 1972.

Theil, H. Economics and Information Theory. Chicago: Rand McNally. 1967.

Toffler, Alvin. Future Shock. New York: Bantam Books. 1970.

UNESCO Bulletin for Libraries. "Intergovernmental Conference on the Planning of National Documentation Library and Archives Infrastructures. Paris, September 23-27." Vol. 24. No. 1 (January/February) 1975.

U.S. Congress. Joint Committee on Printing. Government Printing and Binding Regulations. No. 23. October, 1974.

U.S. Congress. House. Management of Information and Knowledge. Panel on Science and Technology. 11th Meeting. Proceedings Before the Committee on Science and Astronautics (91st Congress, 1st Session). January 27-29, 1970.

U.S. Congress. House. Hearings Before the Ways and Means Committee on Confidentiality of Tax Return Information (94th Congress, 2nd Session). 28 January 1976.

U.S. Congress. Library of Congress. Congressional Research Service. Copyright Law Revision. Issue Brief No. IB74117. 7 June 1976.

U.S. Congress. Library of Congress. Congressional Research Service. Library of Congress Information Resources and Services for the U.S. House of Representatives. A Report Prepared for the Ad Hoc Subcommittee on Computers of the Committee on House Administration. Washington, D.C.: Government Printing Office. 1976.

U.S. Congress. Senate. Committee on Government Operations. Privacy and Protection of Personal Information in Europe. Staff Report. March, 1975.

U.S. Congress. Senate. Hearings Before the Subcommittee on Oversight Procedures and the Subcommittee on Reports, Accounting and Management of the Committee on Government Operations (94th Congress, 1st Session) on S. 998, S. 2132, and S. 2443. 10 October 1975.

U.S. Congress. Senate. Hearings Before the Subcommittee on Reorganization and International Organizations of the Committee on Government Operations (87th Congress). 21 September 1962.

U.S. Congress. Senate. Public Hearings Before the Subcommittee on Administration of the Internal Revenue Code of the Finance Committee (94th Congress, 2nd Session). 23 January 1976.

U.S. Department of Health, Education and Welfare. Records, Computers, and the Rights of Citizens. Report of the Secretary's Advisory Committee on Automated Personal Data Systems. Washington, D.C.: Government Printing Office. 1973.

U.S. General Services Administration. Proceedings of the Interagency Automated Data Processing Planning Conference. February 22-24, 1976.

U.S. General Accounting Office. The Protection of Personal Information in an Expanding Federal Computer Network Environment. Draft of a Report to the 94th Congress. July, 1976.

Vagianos, Louis. "Today Is Tomorrow." Library Journal. 1 January 1976.

Ware, Willis H. Computers and Society: The Technological Setting. Santa Monica, California: Rand Corporation. October, 1973.

Weitzman, M.L. "Free Access vs. Private Ownership as Alternative Systems of Managing Common Property." Journal of Economic Theory. Vol. 8. 1974.

Wessel, Milton R. Freedom's Edge: The Computer Threat to Society. Reading, Massachusetts: Addison-Wesley. 1974.

Westin, Alan F. Privacy and Freedom. New York: Atheneum Press. 1967.

Westin, Alan F., ed. Information Technology in a Democracy. Cambridge: Harvard University Press. 1971.

Westin, Alan F., and Baker, Michael A. Databanks in a Free Society: Computers, Record-keeping and Privacy. New York: Quadrangle Books. 1972.

Wilensky, Harold L. Organizational Intelligence: Knowledge and Policy in Government and Industry. New York: Basic Books. 1967.

Wiley, Richard E. Address Before the Third International Conference on Computer Communications. Toronto, Canada. 3 August 1976.

Wright, J. Ward. "City Hall's Approaching Revolution in Service Delivery." Nation's Cities. January, 1972.

Wunderlich, G. "Property Rights and Information." Annals of the American Academy. March, 1974.