

This category reflects government IT issues that span multiple programs within government, those that cross between government agencies and levels of government, as well as those that involve communication and coordination between government, citizens, industry, and non-profit organizations. Kraemer and King (1987) discuss the growing use of information technologies such as telecommunications and management science at all levels of the US Federal systems in terms of its significance to the US Constitution. They indicate that the following aspects of the federal systems are particularly susceptible to disruption due to changes in technology: federal inter-branch relations, intergovernmental relations, relations between government and the people, and political process functions. They propose that these balances are under daily attack by computerization but they tend to be affected primarily at the margins, such as cases where computerization provides a temporary inequity in advantage to one level or agency. They conclude that currently, computerization is not a threat to constitutional arrangements but that it could eventually put at risk personal privacy and political elections and, perhaps to a lesser extent, the separation of powers and federalism.

National Information Infrastructure Initiatives

While design and operation of the NII is primarily in the hands of the private sector, government policy plays a significant role in its development by reforming telecommunications policy, promoting NII applications, resolving information policy issues such as privacy, security, and intellectual property, and investing in long-term R&D (Kalil, 1995). Maule (1994) indicates that the foundation for current information infrastructure projects in both the public and private sector are initiatives and legislation by the Clinton/Gore Administration and Congress, in particular, the National Research and Education Network (NREN) and the National Information Infrastructure Act (NII). Kahin (1992a) describes the mission of the National Research and Education Network and its multiple policy objectives. The breakdown in classic forms in the computer environment due to the computer revolution is discussed as is the concept of flat rate pricing as an important feature of the Internet.

Branscomb and Kahin (1995b) discuss the criticality of standards development in the development of the NII. Three models associated with software applications, the Internet, and facilities-based communication are presented and further point out that interoperability and open systems affect the development of government policies. King (1995) discusses the dilemma of national policy development for information technology in the context of the U.S. national information infrastructure and reviews the technological forces affecting the convergence of computing and communications. He also describes current and future services well as service providers and markets associated with the NII as well as the implications for national competitiveness.

Information Society- Citizen access to information and information technology

Hernon and McClure (1993) discuss the final revision of OMB circular No. A-130, The Management of Federal Information Resources which is described as having government-wide implications as the cornerstone of US government information policy. The circular stresses the public good associated with access to government information and also articulates the relationship of the federal government to state and local governments, the public, and the private sector. Relyea (1994) discusses aspects of the administrative experience with the Freedom of Information Act (FOIA) over the last 30 years. He indicates that the Act has never been held in high regard or enthusiastically implemented by the Executive branch, and that much of its effectiveness can be attributed to Congress. He stresses that the FOIA has not received comprehensive congressional evaluation or examination for over a decade and that its existing procedures could benefit substantially from a reassessment and upgrade in terms of its capacity to contend with electronic formats. Relyea (1996) also discusses the acquisition and dissemination of government information and publications and the relationship between national security and information dissemination (1987).

Guthrie and Dutton (1992) discuss the politics associated with citizen access technology. A comparative study from California cities - Santa Monica, Pasadena, Glendale, and Irvine, examines the factors shaping decisions about network technology to facilitate public access to community information and dialogue. Kahin (1991) discusses the role of the Internet in providing a versatile new environment for the dissemination of government information. He indicates a new consensus that federal information should be distributed in its original form and enhanced by the private sector will be a driving force in the expansion of computer networks. Such factors will therefore blur the distinction between the dissemination of information and access to information under the Freedom of Information Act. Further, while there is opportunity for closer communication between government agencies and the public, the role of intermediaries such as the Government Printing Office and the National Technical Information Service is uncertain.

Gurbaxani et al. (1990) describes government's role in shaping the information society in the context of

Singapore's national computer policy. He describes the high level of government involvement in shaping informatization and computerization in Singapore including a review of the political, social, and cultural environment, and the surrounding economic development and industrial policies. He describes the overall IT infrastructure and three phases of computerization: government computerization, national computerization, and the informatization of society.

Information technology policy and economic development

The relationship between national information technology policies and the impact on national economies is considered extensively in the literature. Kraemer et al. (1992) examine the effectiveness of government policies in promoting the diffusion of information technology through a review of industrial policies in 9 Asia-Pacific nations. The results showed that while some government trade and fiscal policies do facilitate increases in expenditures on computing technologies, the level of economic development was identified as a stronger predictor.

Kraemer et al. (1994a) indicate that the laissez-faire information technology strategy in Hong Kong, reflective of the country's economic strategy, shows little government intervention in the promotion of production or use of IT products and services. Dedrick and Kraemer (1993) present a similar discussion of Australia's treatment of information technology. They indicate that Australia has vacillated between laissez-faire, market-directed strategy and strong government interventionist, plan-directed strategies resulting in a collection of individual strategies as opposed to a single coherent strategy.

Kraemer and Dedrick (1993) describe information technology policy in New Zealand as moving from projectionist and centralized to almost total laissez-faire policies. They indicate that under these policies, New Zealand has become a heavy user of IT, ranking behind only Japan in the Asia-Pacific region, in terms of IT spending as a proportion of GDP, however the laissez-faire approach may have economic and other implications in an international environment in which many other countries directly subsidize the industry and have explicit strategies for IT infrastructure improvements.

Kraemer et al. (1996) discuss Taiwan's coordinated government strategy in supporting private entrepreneurship by a large number of small, flexible, and innovative companies. They indicate that in just 15 years, Taiwan has emerged as a leading producer of hardware for almost every major computer vendor in the world and that Taiwan's success has been due to a coordinated government strategy allowing the country's computer companies to respond rapidly and effectively to changes in the international market.

Dedrick et al. (1995) indicate that there is a somewhat surprising number of small countries (those with populations of less than 10 million), including Hong Kong, Singapore, Israel, Denmark, Finland, and Sweden, with proportionally high rates of development and use of information technology in terms of country size and national resource endowments.

Libraries and Archives

With the advent of new technologies for creating, maintaining, and disseminating information comes a changing role for libraries and archives. Research has been conducted that explores the economics of mechanisms for information dissemination. For example, Kingma (1994) presents an economic model to analyze the cost-efficiency of three alternatives to access to journal articles. The three alternatives discussed are journal subscriptions, consortium membership, and commercial document delivery. The results of the analysis indicate that cost efficiency is based upon such factors as the value of future journal use, the value of time to patrons, and the costs of delivery and subscriptions. Kingma and Eppard (1992) discuss the escalation of journal prices in terms of equilibrium between the library market and the market for individual subscriptions. They argue that the availability of high quality photocopying has increased individuals' reliance on library subscriptions and propose that a socially responsible solution to the problem of journal price escalation is to increase the cost of photocopying and restrict journal use to within the library. Kingma (1996) analyzes the economic efficiency of library consortia in the provision of journal articles by way of journal subscriptions versus interlibrary loan through the development of a cost matrix that includes variables for: the fixed costs of journal subscriptions, the marginal costs of lending, access, and borrowing; as well as three different opportunity costs of patrons in terms of time, money and other factors.

Also of importance is the development of mechanisms to support the archival preservation of digital records. Hedstrom and Kowlowitz (1988) report on a project conducted by the New York State Archives and Records Administration that identified measures required to improve the management and preservation of machine

readable records. They describe the scope and nature of computer use in New York State, and provide criteria for, and the process associated with, the selection of records for permanent preservation. They further describe methods for developing working relationships between archivists and staff of government agencies that produce records. Hedstrom (1993) reports on a needs assessment focused on training archivists about electronic records and automated techniques.

Boettcher and Kingma (1994) discuss four purchasing options for telephone directories, one of the most highly used sources of information in a library's reference collection. They indicate that telephone directories are a stable reference tool with a strong history of use, they are familiar to most users, and that resources such as the community and yellow pages are widely used. The future of an all-print telephone directory collection in libraries is questioned in terms of the availability of CD-ROM technology and the cost of printed directories. They provide a framework for cost analysis for the following four telephone directory purchasing options: printed directories, directory assistance, phone-fiche, and CD-ROMs.

As the role of libraries changes, the role of librarians must also change substantially. Librarians and archivists are required to deal with records in an increasing number of forms and formats. Critical to this shift is the identification and delivery of educational programs that prepare librarians and archivists for their new role. Lenk (1987) describes the future role of libraries in terms of the public objective of the provision of technical information. McClure (1995) discusses the gap between the communications technologies available to the public and the public's level of ability to use them. He discusses the federal government's policy on universal access, factors that negatively affect public library involvement in Internet access, and elements associated with the clarification of the role of public libraries. McClure et al. (1996) contend that, with a decreasing federal emphasis on the role that libraries will play in the NII, public libraries must proactively develop their own presence or role. They examine current federal policies and new roles for libraries in ensuring connectivity and offer recommendations for the implementation of both federal policy and connectivity. Additionally, they discuss strategies and policy initiatives for federal, state, and local governments, as well as for librarians and vendors.
