

CONTENTS

1 Introduction 2

2 Program Research 1975-76 4

3 Teaching 1975-76 30

4 Faculty Seminars 32

5 Presentations of Research Results 1975-76 34

6 Publications 1975-76 37

7 Reviewers 1975-76 45

AFFILIATES

American Can Company
 American Telephone and Telegraph
 Arthur D. Little Foundation
 Booth Newspapers
 Bunker Ramo Corporation
 Codex Corporation
 Computer and Communications Industry
 Association
 Data Transmission Company
 Donaldson, Lufkin & Jenrette
 L.M. Ericsson (Sweden)
 Federal Communications Commission
 Federal Reserve Bank of Boston
 First National Bank of Boston
 General Electric Company
 Harte-Hanks Newspapers
 IBM Corporation
 International Data Corporation
 International Paper Company
 Lee Enterprises
 Lockheed Missiles and Space Company
 John & Mary R. Markle Foundation
 Mead Corporation
 Minneapolis Star and Tribune Company
 New York Times Company
 Nippon Electric Company
 Norfolk & Western Railway Company
 Pitney Bowes, Inc.
 PRC Information Sciences Company
 RCA Global Communications
 Rockefeller Brothers Fund
 Rockwell International
 Salomon Brothers
 Seiden & De Cuevas, Inc.

Systems Applications, Inc.
 Time Incorporated
 Transamerica Corporation
 United Telecommunications, Inc.
 U.S. Department of Commerce:
 National Technical Information Service
 Office of Telecommunications
 Western Union Corporation
 Western Union International, Inc.
 Zenith Radio Corporation

STUDENT ASSISTANTSHIPS

William Bingham Foundation

**INFORMATION RESOURCES POLICY:
 PROGRAM PROJECTS
 ANNUAL REPORT 1975-76
 VOLUME 2**

The Program on Information Resources Policy is the new name of the Program on Information Technologies and Public Policy at Harvard University. Available on request is Volume 1 of the annual report for 1975-76, *Information Resources Policy: Arenas, Players and Stakes*.

**PROGRAM ON INFORMATION RESOURCES
 POLICY**

200 Aiken Computation Laboratory
 Harvard University
 Cambridge, Massachusetts 02138
 617 495-3986

In its four years of work, the Program on Information Resources Policy has conducted some fifty studies of various aspects of information resources and the policies that influence their use. The chart at the back of this booklet shows in outline how the Program has proceeded with its work.

The research projects are divided among a dozen "arenas". An arena is a place of turmoil in information policy. Our research projects describe the issues, the players, the policy options and their likely consequences for each arena.

In the pages that follow, each arena that the Program has studied is described and each research project summarized. There are still other arenas to be examined, but this booklet describes only what we have already done or have under way.

In addition to summarizing the research projects, this booklet also gives details of how our research results reach the players and the public, including our teaching, seminars and publications.

Figure 1.

THE RESOURCES OF SOCIETIES

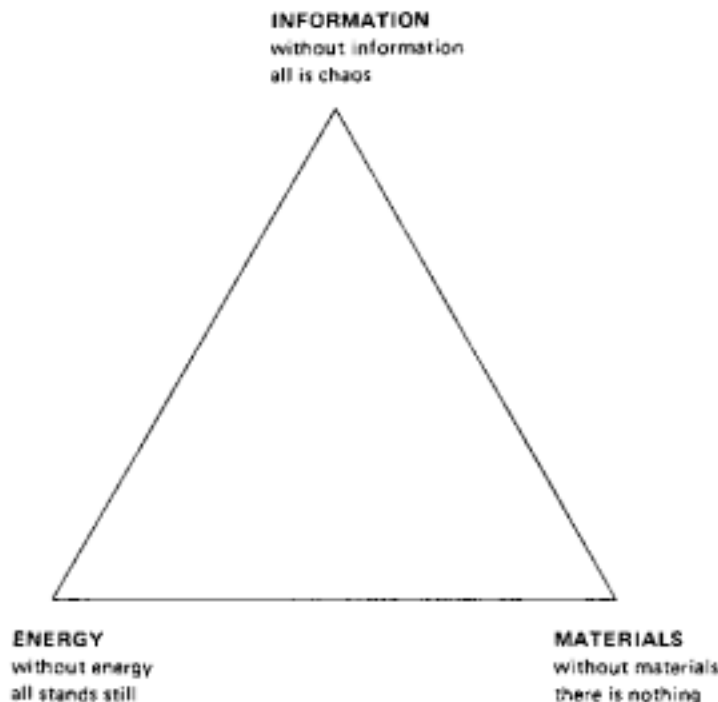


Figure 2.

THE INFORMATION INDUSTRIES

	Approximate Gross Revenues (in billions of dollars)					
	1970	1971	1972	1973	1974	1975
Broadcast television	2.8	2.8	3.2	3.5	3.8	NA
Cable television	0.3	0.3	0.4	0.5	0.6	0.7
Broadcast radio	1.1	1.3	1.4	1.5	1.6	NA
Telephone	18.2	20.0	22.6	25.5	28.3	31.3
Telegraph	0.4	0.4	0.4	0.5	0.5	0.5
Specialized common carriers	0.0	0.0	0.0	0.0	0.0	0.0
Satellite carriers	0.1	0.1	0.1	0.1	0.1	0.1
Mobile radio systems	2.0	2.2	2.4	2.6	2.9	NA
Motion pictures	3.8	3.8	2.9	3.8	NA	NA
Organized sports, theaters, etc.	4.4	NA	NA	NA	NA	NA
Computer software suppliers	1.5	1.7	2.0	2.5	3.0	3.6
Computer service suppliers						
Postal service	6.3	6.7	7.9	8.3	9.0	10.0
Private information delivery services	0.7+	0.8+	1.0+	1.2+	1.3+	1.6+
Newspapers; wire services	7.0	7.4	8.3	8.9	9.4	9.7
Periodicals (including newsletters)	3.2	3.2	3.5	3.9	4.0	4.2
Business consulting services	0.9	1.1	1.1	1.5	NA	NA
Advertising	7.9	7.6	8.0	8.6	NA	NA
Marketing and sales	32.4	37.7	41.3	43.4	45.5	NA
Brokerage industries	40.6	47.4	55.3	61.0	NA	NA
Book publishing and printing	3.4	3.6	3.8	4.2	4.6	4.9
Libraries	2.1	NA	3.6	NA	NA	NA
Schooling	70.2	76.7	83.1	89.1*	98.8*	110.4*
Research and development	26.0	26.7	28.4	30.4*	32.0*	34.3*
Federal information institutions						
Census Bureau	0.1	0.1	0.1	0.1	0.1	0.1
National intelligence community	4.0+*	NA	NA	NA	7.0*	10.0+*
National Technical Information Service	0.0	0.0	0.0	0.0	0.0	0.0
Social Security Administration	1.0	1.2	1.3	1.4	1.9	2.2
County agents	0.3	0.4	0.4	0.5	0.5	0.6
Banking and credit	61.1	68.9	77.6	101.3	NA	NA
Insurance	92.6	103.5	113.8	123.6	NA	NA
Legal services	8.5	9.6	10.5	12.2	NA	NA
U. S. Gross National Product	977.1	1,054.9	1,158.0	1,294.9	1,406.9	1,498.9

*estimated

ARENA: INFORMATION RESOURCES

The whole subject matter of the Program's work is information resources. The term is not in common use; its definition is incomplete. Like most generalities, it is defined by its components.

Information resources can be divided roughly, and only roughly, into two components:

- The *information infrastructure* consists of the physical facilities used for gathering, storing, processing and distributing information. The purest examples are the functions and operations of the telephone, computer, and postal industries. In general, the organizations of the infrastructure are concerned more with how information is handled than with what is handled, with conduits rather than contents.
- The *information sources and elements* include organizations with a principal concern with content, such as the media, libraries, education, or electronic funds transfer systems.

This division certainly does not qualify as grand theory. Most of the media are content and conduit combined, like broadcasting. The conduits of the information infrastructure often influence what is gathered, stored, processed, and distributed. The distinction has proven useful, however; finer distinctions are still in the future.

Still, information resources is more than the sum of its parts. The term is also meant to convey the idea that information is a resource in the same sense that energy and materials are resources. Resources are fundamental building blocks of organized activity. Resources are pervasive. They are the sources of strategic strength and strategic weakness. Any imbalance in resources can result in disaster; any advantage in resources can result in triumph. Resources merit the attention of the highest political processes. Energy and materials have received that attention, but information has not.

The Program has conducted thus far three studies of information as a fundamental resource.

A REPORT TO THE SENATE

In a report prepared for the U.S. Senate Committee on Foreign Relations, the Program asks:

Must There Be An International 'Crisis' To Get The United States To Act On Information Resources? The question and accompanying documentation were designed to stimulate consideration by the Committee

of the concept that information resources are both strategic strengths and strategic weaknesses for the U.S.

The Committee commissioned the report as a contribution to its considerations of "Foreign Policy Choices For The 1970's and 1980's".

To support its contention that information resources are a unique national asset, the paper cites current Pentagon worries over safeguarding U.S. strategic know-how. And it demonstrates the rising importance of a traditional information industry — mass media — and a new one — banking — to America's international relations.

But, as the report states, "Information resources are not yet treated as a strategic strength like energy reserves. Nor are the strategic weaknesses of the communications systems that transmit information yet adequately understood."

A CITIZEN'S GUIDE TO INFORMATION TECHNOLOGIES AND AMERICAN DEMOCRACY

True or false?

- The free flow of information has always been an American ideal.
- Trials and other public proceedings should be broadcast.
- Every important public issue should be submitted to an instant Touch-tone plebiscite.
- Computer-based planning can rationalize policy-making.
- By 1984, they'll have every room in the country bugged.
- Modern information resources concentrate the political process.
- Modern information resources alienate citizens from the political process.

Whatever the answers might be, information resources have had their greatest prominence in the United States. Much of the technological innovation that brought increased capability to information systems originated in this country. Nowhere else are information resources so widely developed and applied. No where else have these developments taken place outside close government control.

Alan F. Westin has begun a study of the direct impacts that new information technologies have had on democratic values and processes in the first twenty-five years of the "information revolution." Drawing on his own research and that of other Program participants, Westin will focus on five areas of political life:

- Individual rights of privacy, confidentiality, and due process.

The report leaves one issue with the Committee, an issue Chairman John Sparkman (D. Ala.) intends to address in hearings. With America moving into what sociologist Daniel Bell calls an "information age", can the nation afford to be as complacent about information resources as it once was about food, money and energy?

The report was prepared by **William H. Read**, Research Fellow from the White House Office of Telecommunications Policy, with John LeGates, Anthony G. Oettinger and Carol Weinhaus of the Program staff.

- Public rights of access to government and private information.
- Citizen participation in the electoral process, or "electronic democracy".
- Centralization and decentralization of political processes and structures.
- The contributions of information technologies to rational and effective government.

Westin is preparing a working paper on his project for distribution to reviewers in the fall of 1976. The aim of the project is preparation of a citizen's guide to information technologies and their effects on American democracy. The guide will distinguish between blue-sky technical possibilities and real possibilities in the slow and complicated American pluralist system. For each of the five areas of political life listed above, Westin will set forth what has changed and what remains the same after twenty-five years, what balances have been struck between conflicting claims and what imbalances may need attention.

Alan Westin is Professor of Public Law and Government at Columbia University and a Program research fellow. He is the author of *Privacy and Freedom* and the editor of *Information Technologies in a Democracy*. He was a member of the Computer Science and Engineering Board of the National Academy of Sciences, for which he was Project Director for the report *Databanks in a Free Society: Computers, Record Keeping and Privacy*.

Peter D. Shapiro and Anthony G. Oettinger prepared a 5000-word feature article, *Understanding Information Industries in America*, that appeared in the 1975 *Britannica Book Of The Year*.

The article gives the lay reader a broad view of the role information industries play in our society and of their impact on public policy.

The information industries are large, and growing more rapidly than the Gross National Product.

They are becoming increasingly intertwined, and often technologically indistinguishable. The public has a considerable stake in certain information issues. Two of these, privacy and access to information, and public control over media content are described and other issues are listed.

The article has been reprinted and is available as a Program publication.

ARENA: POSTAL SERVICES

The U.S. Mail is one of the oldest and largest civilian activities of the government. The Post Office not only established an integrated national system of information transfer, but also played a major role in promoting and subsidizing transportation, trade and commerce through its interest in post roads, railways and airlines.

The operation of the post has always been marked by political debate and economic competition. Questions about the nature of state activities have been continually raised. Should the post be a low-cost, wide-scale subsidized service? Or should it "pay its own way"? In most countries, a ministry of post, telegraph and telephone controls information transfer, but in the U.S. even the postal monopoly is often diluted.

At present, the vitality of the postal service is seriously in question. More than half its package business has been taken over by United Parcel Service. Other private services are offering door-to-door delivery of magazines, circulars, catalogs, and samples at a discount on postal rates. Electronic information transfer systems also offer competition. Electronic funds transfer systems in particular appear to be chipping away at the first class service.

The settlement of postal issues can foreshadow possibilities for other communications areas where competition and government intervention are at issue. The Program has three studies in the postal arena.

THE U.S. MAIL: WHO PAYS, WHO PLAYS

In a Program working paper, **Gordon Imrie** describes the dynamics of the postal rate-setting processes in detail. The paper gives principal attention to the interests and strengths of the various concerned parties, from the United Parcel Service to the National Association of Greeting Card Publishers. The paper concentrates on facts of postal operations and offers the reader an extensive introduction to postal statistics and rate-making machinery.

In particular, Imrie focuses on Docket R-74-1, a major rate increase attempt filed by the new U.S. Postal Service before the Postal Rate Commission. Both institutions were established by the Postal Reorganization Act of 1970. Proceedings under R-74-1 consumed 23 months and produced 10,000 pages of transcript, in the course of which most major postal players commented on the new postal establishment and its rules, and in so doing, told

something of themselves.

The report offers insights on many different kinds of information issues and is also of great intrinsic interest. In 1975, the Postal Service distributed 89 billion pieces of mail using 702,000 employees, 303,000 mail receptacles, 31,000 post offices, and

\$12.6 billion. This makes the Postal Service one of the world's largest information networks.

Imrie is a graduate of the Harvard Business School and of Stanford University where he studied political science and communication. He is now with IBM.

GOVERNMENT, SOCIETY AND THE MAIL

When the American republic was founded, the Post Office held a virtual monopoly on information transfer. In the years to come it would subsidize the growth of the national transportation system and provide unsurpassed patronage opportunities for the developing system of political parties. Over the years, various services have been included in the postal system — parcel post, postal savings and money orders, Rural Free Delivery — or excluded — telephone and telegraph — depending on the social and political circumstances of the times.

The social and political circumstances of the recent past and present dictated the postal reorganization of 1970. **Charles G. Benda** is studying the changing role and function of the post office in American history, with particular emphasis on the new arrangement. Why in 1970 did Congress choose to end its fiscal and political control of the mails?

And what control of postal policy has Congress retained? What control might Congress want back?

And, most important, what does the future hold for the U.S. Postal Service? Can it keep pace with the modern giants of information transfer? Do services such as the Mailgram and a rudimentary funds-transfer system mean that the Post Office can become an important user of electronic technologies or be killed off by them? What are the present and future markets for a slow and steady system of hard-copy transfer? What problems of the old system have been solved? What problems does the new system present?

Benda is a doctoral candidate in sociology. His report will be part of his thesis. His work is being supervised by Professors Daniel Bell and Theda Skocpol of the Sociology Department, and by Tony Ottinger.

GLOSSARY OF RATESPEAK

Until 1970, the Post Office's accounting practices made little connection between the cost of providing a service and the rates charged for it. The reorganized Postal System now uses an approach quite similar to that used in telephone regulation to relate prices to costs. Costing and pricing practices are a recurrent policy problem in many information arenas, but hard to understand if you don't speak the language. **Arlene Karlin** has taken a first step toward explaining mail and telephone ratespeak to non-speakers.

In a Program working paper issued in January 1976, she elucidates nearly one hundred arcane words and phrases used in mail and telephone accounting. The paper draws partly on the pristine definitions of the accounting literature, but mainly on the actual usage of the interested parties.

The result is not a dictionary, but a glossary; each word or phrase is not only defined, but explained and discussed. Hidden issues are raised and relations between the mail and the telephone accounting systems made plain.

The mails and telephony are characterized by a high proportion of costs that are joint or common to many diverse services and by market structures that idealized monopolistic or competitive models do not account for. The approaches to these problems may be of interest to readers working in other arenas with similar costing and pricing situations.

Arlene Karlin is an operations research analyst for the Department of Transportation. She is a graduate of Jackson College for Women and holds a masters' degree from Harvard in applied mathematics.

The technologies for communicating and computing were once separate, but they are separate no longer. The telephone switching system is a computer. Physically separate computer facilities use telephone connections to form larger computers. The Program has coined the term *communications* for this emerging common technology for communication and computation. As communications develop, the once clear distinction between the *functions* of communications and computation grows cloudy, old policies wither and new institutional and political battles loom, nationally and internationally.

Communications is built on a common technological base, but institutionally it is divided between two giants, the telephone industry led by A.T.&T. and the computer industry led by IBM. Their confrontation is just beginning.

In national policy, communications is an unwanted child, ordered about here, ignored there, but a baleful presence wherever it appears. Congress placed responsibility for communications policy at the Federal Communications Commission in 1934, but hasn't given the subject must attention since then. Data processing is unregulated, but since data processing and communicating are becoming indistinguishable, the FCC is left with a problem. A five-year inquiry into the same subject has already begun. Justice Department antitrust suits are underway against both AT&T and IBM.

Internationally, political borders are as fuzzy as the computer/communications border. Balkan Bulgarian Airlines, Malev Hungarian Airlines, and LOT Polish Airlines, among others, book local flights through a computer in Atlanta. Canadian plant payrolls are made up in St. Louis. An American built satellite is broadcasting directly to villages in India. Whose information resources are these? Who controls them? With what means? In whose national interest?

The emergence of communications was an early focal point of the Program's interests. Thus far we have eight studies on national aspects of communications and three studies on international aspects.

COMMUNICATIONS IN THE UNITED STATES

A POLICY AGENDA FOR COMMUNICATIONS

In a Program working paper, *Performance, Politics and Policy in Computer/Communications*, **Anthony G. Oettinger** asks seven pointed questions about future policy for communications, and sketches in the shapes of the answers:

- What shall be our policy aims for the 1980s and beyond?
- What is to be the scope of these policies?
- Who will decide what the aims and scope of policy should be?
- What are the limitations of present policy tools?
- What new policy tools and institutions might we need?
- What industry structures will be desirable?
- How can we best harmonize domestic and foreign policy tools?

The paper serves as a brief introduction to the communications arena. Oettinger is the Program's Director.

TELECOMMUNICATIONS POLICY DEVELOPMENTS

William M. Capron's remarks delivered at the Aspen Institute Program on Communications and Society meeting in Washington at the Brookings Institute in the spring of 1976 have been reprinted as a Program working paper. Capron develops in a somewhat different fashion from Oettinger some of the policy problems and possibilities in communications. As he

summarizes himself, "In short, there is no quick policy fix and no quick and easy organizational fix. Nor is there a neat 'technological' fix."

Capron is senior lecturer on political economy at the John F. Kennedy School of Government and associate dean. He is a member of the Program's Executive and Policy Committees.

THE MEDIUM AND THE TELEPHONE

Paul Berman and Tony Oettinger provide a cross-sectional view of the making of policy on information resources in a Program publication entitled *The Medium and the Telephone: The Politics of Information Resources*. In this paper of 164 pages and 49 charts and tables, the authors trace all the factors that go into the provision of private-line services to broadcast networks and news organizations. Following this single thread, the paper illustrates and illuminates

the confusing progress of telecommunications policy.

(When Program reports are lengthy, they are preceded by an executive summary. The following discussion is from the executive summary for this project.)

"Government control of information policy is not centralized in the United States. Much power sits with the states. Within the federal government, information policy may stem from the Executive

Figure 3.
REACHING VARIED PUBLICS —
THROUGH PROGRAM RESEARCH



Branch, the courts, or major government information users, but Congress has delegated explicit policy-making to the Federal Communications Commission.

"These arrangements are much as they were in 1934 when the FCC was set up to oversee communications services that were technologically distinct, specialized and scarce. Today, versatility and abundance in information resources have supplanted scarcity and specialization. And technological distinction has ended.

"While the FCC wasn't looking, communications technology merged with computer technology to form *communications technology*. At the same time, control of information resources has become big business and big government, nationally and internationally. Information systems now play strategic roles in many realms that have become so thoroughly intertwined that a tug on any string threatens to disturb all the others. And there is a lot of tugging going on. The resulting strains on our traditional ways of understanding and managing information resources are severe.

"This report sketches the web of relations among domestic information systems. It portrays the many political, economic and technological factors that are shaping our future opportunities for information use in the decades ahead. Rather than try to tell all about everything, the authors concentrate on string-tugging as it affects gathering and disseminating the news. Broadcasting networks and news services are completely dependent on the national and international system of information transmission; the importance of their product is well understood; their situation is typical enough to serve as an example. Study of news transmission leads inevitably to study of the American telephone system, dominated by AT&T, which has won a place in every information transfer scheme worthy of the name.

"The report shows how the telephone system reached this central position, and how it operates within the framework of the FCC, state regulators and antitrust proceedings. Particularly stressed are

events of the past decades that have radically increased competition for the telephone system.

"Competition has come not only in the long-distance transmission of information, a most potent source of telephone profits and power. It has come also at the instrument itself as facilities for processing every form of information have been plugged in to the basic system. The most important new competitor is itself a growing giant. It is the computer industry with the central position held by IBM. Technological change has made it more and more difficult to tell the inside of the telephone system from outside "attachments". This is the essence of communications.

"The stakes of all the various players of the communications game and the issues that divide them are described in detail. Having thus set the stage, the authors address the possible forms that information policy issues may take in the coming decades.

"The report is meant to introduce the entire area of information policy as well as to illustrate how information policy works to affect the gathering and dissemination of news. Most of the important technical, legal and economic questions are discussed, with emphasis on the domestic scene. The end result is of interest to anyone, doer or done to, who has been seeking a handle by which to grasp these developments."

This paper is being used as a text on telecommunications policy at the FCC and in the Bell System, as well as in several universities. Together with William Read's companion papers on international communications policy, it serves as a full introduction to policy problems in this arena.

Berman, who was with the Program since its inception, is a graduate of Harvard College in computer science and of Harvard Law School. He left in August 1975 to join the law firm of Covington and Burling in Washington, D.C., but he is continuing to collaborate in Program research.

THE FCC AT THE COMPUTER/COMMUNICATIONS BORDER

The FCC has had some difficulties in dealing with the advent of new computer/communications technologies. In his study, *Computers or Communications? Allocation of Functions and the Role of the FCC*, which was completed in May 1974, Paul Berman studied in considerable detail the Commission's attempts to catch up with technology.

In 1971, the FCC confirmed a previously tentative decision, known generically as the Computer Rules, which showed where the FCC felt the boundary should be drawn between computers and telecommunications, or, more precisely, between regulated and unregulated data processing. Warfare at this border continues to flare up. Early in 1976, Satel-

lite Business Systems, Inc., a consortium formed by IBM, Aetna Casualty and Surety Company, and COMSAT, requested FCC permission to operate a satellite-based network. The public has a considerable social and economic stake in which services of this sort are regulated and which are not.

In his research, Berman compares three services. They are directory assistance, automatic location of callers through the "911" emergency number, and packet-switched computer-to-computer communications. Drawing on these examples, he develops the legal and technological factors supporting

or undercutting the FCC and those who seek an unregulated market, the options available to policy-makers, and the consequences likely to flow from exercising any option.

Berman's conclusion is that "the decision to employ the FCC's allocation mechanism need not have been made by the Commission, and indeed may not have been an appropriate decision for it to make", and that in all likelihood the decision will have to be made again by other policy-makers, including Congress and the courts.

COMMUNICATIONS POLICY HANDBOOK

The confrontation between competitors in communications is forcing Congress to reevaluate government regulation of communications. Since Congress last looked, there have been three decades of computers, space walks, transistors, integrated circuits, hot and cold war, and unprecedented economic and cultural growth. Everything has changed and the lawmakers will be traveling in unfamiliar and treacherous territory.

Intense lobbying efforts are underway. Industry chiefs, union leaders, local officials will attempt to assist Congress in its decision, all with economic and technical literature in array. At present, there is no simple publication designed to make a broader public policy debate possible. The absence of an unbiased guide to the quiddities and perplexities of this arena is an effective restraint on intelligent and broad public participation in the making of important national policy.

The Program is preparing such a publication.

PUBLIC POLICY AND THE "SPECIALIZED" CARRIER MARKET

During his two years with the Program, **Peter D. Shapiro** studied the structure of the market for specialized, private-line telecommunications, such as the private telephone systems operated by nationwide firms and the high-technology data transmission systems like those operated by Microwave Communications, Inc. (MCI), or Telenet, Inc.

Conventional approaches to the making of telecommunications policy usually begin and end with the FCC. The Commission's regulations are seen as determining the market structure which, in turn, in this view shapes the performance of firms in the market. Shapiro finds the market structure far more complex, an interplay involving, to varying degrees,

The Reference Guide on Telecommunications Monopoly vs. Competition, by **William H. Read** and **William O. Roberts**. The guide will be in four parts:

- A chronology of the previous one hundred years of telecommunications in the U.S., giving technical, social and legislative benchmarks.
- A glossary giving definitions in layman's language covering organizations, agencies, and institutions involved in the policymaking process. Where definitions are in dispute, more than one will be given.
- A legislative and regulatory record including annotated abstracts of legislation, regulatory decisions, agency inquiries and other documentation.
- A brief but full bibliography.

William Roberts is a graduate of the School of Foreign Service at Georgetown University and is studying law at Suffolk University.

public policy, the strategies of firms, financing, technology, and the needs of telecommunications buyers.

Nor is public policy-making limited to the FCC. Shapiro also examines the roles of Congress; the Courts; the White House Office of Telecommunications Policy; the Department of Justice; state public utility commissioners and their National Association of Regulatory Utility Commissioners; and the government agencies responsible for procuring communications facilities, notably the General Services Administration and the Defense Communications Agency.

In Shapiro's view, the monolithic public-policy-maker is replaced by the actions, not necessar-

ily concerted, of many public bodies and by their interplay with the actions of other parties in an ongoing market structuring process.

Shapiro's conceptual framework and initial empirical findings are set forth in his Program working paper, *Public Policy as a Determinant of Market Structure: The Case of the Specialized Communications Market*.

The text, charts and maps of the main introductory chapter of Shapiro's paper characterize the services in the specialized communications market, the public's stake in the market and the parties involved in the structuring process. The bulk of the work details the interactions of public policy with each of the other factors in turn. In each case, major questions about the interactions are set forth, and hypotheses are developed about what strategies (in-

cluding randomness) the various parties might be following. Empirical data, primarily from public records, supporting each hypothesis are also given.

These hypotheses give preliminary clues as to the nature of the goals of the various parties in the struggle over specialized carriage. They also suggest the effectiveness of each party in advancing its goals and set out the public stakes favored or disfavored by the existing market structuring process.

Shapiro, a political science graduate of the University of British Columbia, holds a Ph.D. in communications research from Stanford. He was one of the earliest program participants. In July 1974, he joined the staff of Arthur D. Little, Inc., an affiliated corporation, and he remains a research fellow in the Program.

LONG-DISTANCE RATES: WHO GETS WHAT?

Long-distance telephone calls often use the facilities of several telephone companies. Each of the companies providing service has a claim on the revenues generated by the call. Intrastate rates are set by state regulators. Interstate rates are set by the FCC. Costs and revenues are parcelled out under complicated intercompany settlements and jurisdictional separations devised under mandates to assure each provider of service with a fair share of the revenues and each user with a fair price for the service. Since long-distance service is one of the most potent sources of telephone revenues, these determinations of the cost of providing the service and the revenue split are an important ingredient of telephone rate-setting.

No matter how important they are, they are not widely understood. How these processes were

begun and how they got to where they are today is the subject of a research project undertaken by **James W. Sichter**, an executive of United Telecommunications, Inc.

Sichter's interest was stimulated by the Program's reviewing process. Sichter reviewed a draft of Berman and Oettinger's paper, *The Medium and the Telephone*, and found fault with their discussion of separations and settlements. Sichter undertook some research of his own in preparing his critique. The Program found it interesting and asked him to revise and expand on it. Going through the reviewing process itself, Sichter's paper, *Separations Procedures in the Telephone Industry: The Historical Origins of a Public Policy*, is now available as a Program working paper.

COMPETITION AND MONOPOLY: THE LEGAL BASIS FOR FCC REGULATION

Hamilton Loeb is studying recent FCC decisions which have opened up competition for the established telephone carriers from the "specialized" common carriers, who may not be so special as they seem. Loeb's focuses on the authority granted the FCC in the Communications Act of 1934 as it affects telephone service and on the process by which that authority has been expanded and limited by the courts.

Loeb is analyzing the history and pre-history of the Communications Act, looking closely at the promise of "service to all" and the telephone regulatory processes established in the Act. FCC and court decisions are examined, beginning with *FCC v. RCA Communications*, decided by the Supreme Court in 1953, through the foreign attachment and specialized common carrier cases of the last eight years.

Have Congress and the courts directed the FCC to foster competition in telephony? Have they marked out compartments where the FCC may not foster competition? In addressing these questions, Loeb's research is not confined to legal materials, but also draws on the assistance of players both favoring

and opposing pending legislation on telephone competition.

Loeb is in his second year at the Law School. He is a graduate of the University of Virginia and has worked as a news broadcaster and as legislative assistant to a Member of Congress.

VIDEO TELEPHONE

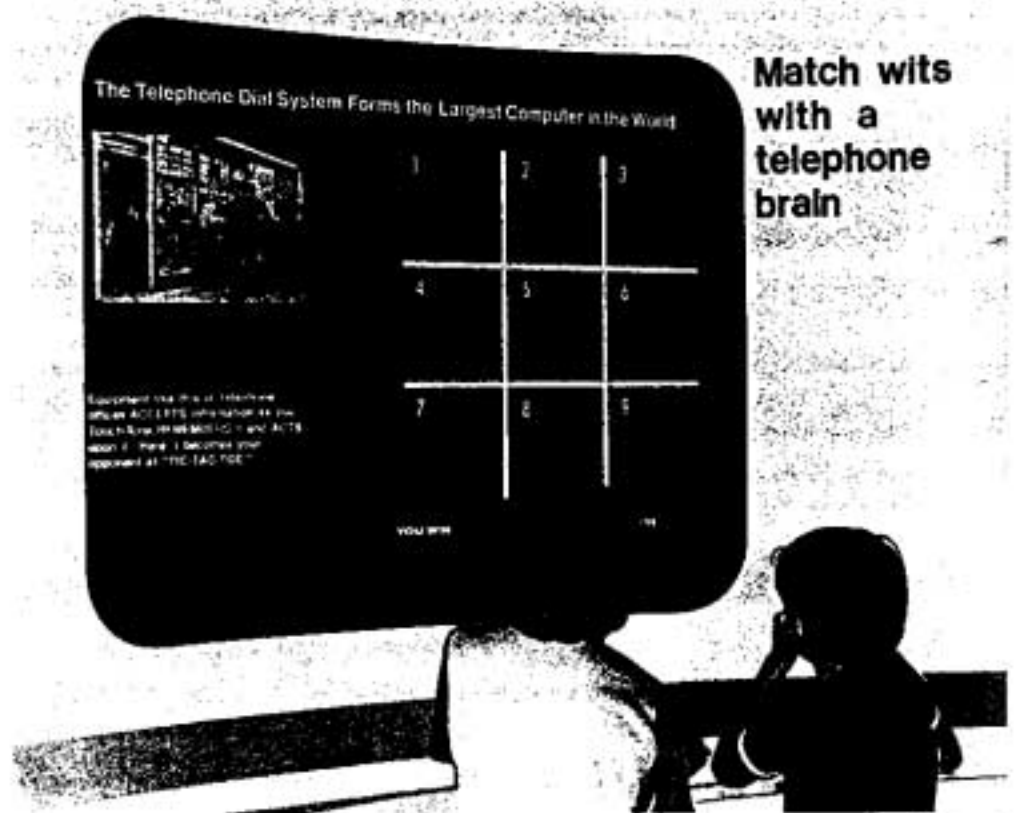
Peter Shapiro and **Tony Oettinger** have written a critique of *The Video Telephone - A New Era in Telecommunications - A Preliminary Technology Assessment* (Praeger, New York, 1974), a book by Edward M. Dickson and Raymond Bowers of Cornell's Program on Science, Technology and Society. The critique — with rejoinder and rebuttal — appears in the Autumn 1974 issue of the *Journal of Communication*.

Dickson and Bowers describe the technology of the video telephone and competing two-way visual communications systems and attempt to anticipate the broad consequences of a change from voice to video in the nation's telecommunications systems and also examine the consequences in such realms as

medical care and education. Oettinger and Shapiro endorse the technological content of the book, but detect some omissions, and criticize the value of this "technology assessment" as a scholarly approach to helping policy makers.

The Program originally undertook this brief study at the request of the authors for collegial criticism. A subsequent request by the National Science Foundation's RANN (Research Applied to National Needs) program for a confidential evaluation of the book prompted a decision to seek open publication, in the belief that the published results of policy research at universities are best reviewed in open forum.

Figure 4.
THE TELEPHONE SYSTEM AS COMPUTER



This is a communications game devised by New England Telephone with Bell Labs and Western Electric for exhibit at the Boston Museum of Science.

Photo: John Glynn for the Museum of Science

A COMPUTER UTILITY OR A COMPUTER IN EVERY BASEMENT?

The giant computer utility — a nationwide chain of computers linked to every home and office through remote-access terminals — has become a standard feature of technological forecasts. The smaller, stand-alone computer in every livingroom has been relegated to the forecasters' Never Never Land along with the airplane once predicted for every garage.

Montgomery Phister, Jr., in a Program working paper, has examined these paired predictions on future computer use. Although computer utility development is proceeding, with certain cost and functional virtues apparent, Phister concludes that such systems also have special weaknesses, notably system inefficiency. Stand-alone computers offer the

advantages of reliability, specialization of functions, and freedom from problems of communication. They are also dropping rapidly in price.

In his working paper, Phister describes the functions likely to be best suited to each type of computer, and makes cost and functional comparisons for a variety of conditions. His conclusion is that the small system is likely to become as widely used as the car, while the large computer utility will fail to develop.

Formerly Vice President and Manager, Computer Systems Division at Xerox Data Systems, Phister spent the 1974 fall semester as a research fellow with the Program.

COMMUNICATIONS IN THE INTERNATIONAL SETTING

THE HIGH AND LOW POLITICS OF INTERNATIONAL COMMUNICATION

How do cross-border computer communications fit with traditional concepts of international policy making? In his study, *Foreign Policy: The High and Low Politics of Telecommunications*, **William H. Read** found that international data flows are but a part of new international communications conditions that are fostering global interdependence. Transnational organizations are deriving added strength from information technologies.

But the application of these technologies, Read argues, can also produce strategic weaknesses. Vital information resources of multinational enterprises today flow through a global telecommunications web that has become the very nerve system of interdependence. Thus the system itself is a potential source of strategic vulnerability.

Yet, while the nature of international com-

munications has been revolutionized in recent years, the policy process remains essentially unchanged. Read questions the continuation of carrier domination. While Read does not think that AT&T, RCA, ITT and WU "should now take a back seat in the making of bilateral and multilateral telecommunications policies," he does see the lack of policy making participation by transnational organizations as unnecessarily risky.

At a time when telecommunications has become one of the international lifelines of global interdependence, it seems prudent, Read recommends, to reevaluate the way in which U.S. telecommunications foreign policy is formulated. The place to begin, he says, is with the users. And the time to begin is now, before "something like a 'Law of Communications Conference' forces the issue."

TELECOMMUNICATIONS IN DEVELOPING COUNTRIES — WHO GAINS? WHO LOSES?

Developing countries are investing heavily in modern communications systems. Broadcasting systems are expected to facilitate national integration and speed up education. Telecommunications improvements are widely regarded as necessary for the development of modern industry. For the period 1972-76, the World Bank budgeted \$610 million for telecommunications

in 22 countries.

John Clippinger has completed exploratory studies of the introduction of instructional television in El Salvador and of the building of a modern telecommunications system in Algeria. The results are reported in a Program working paper, *Who Gains by Communications Development?* in Algeria. Clippinger

found that telecommunications development appeared to accentuate rural and urban differences and further the interests of an urban technocracy. Likewise in El Salvador, he reports, instructional television appeared to do more for the political base of the ruling party than it did for the students.

Clippinger is now preparing a proposal to extend this study to other countries. The project will have two major tasks:

- To assess the interests helped or harmed by communications development.

- To analyse the technological, economic, political and cultural factors that have most to do with communications development.

The study is intended to aid those involved in such work to make more effective use of communications technologies for development. Clippinger is a research fellow with the Program. He holds a Ph.D. in communication from the Annenberg School of Communication at the University of Pennsylvania and a B.A. in anthropology from Yale University.

EUROPE'S COMPUTER INDUSTRY

In his teaching and research on manufacturing policy in industrial organizations at the Business School,

Robert Hayes has developed a number of interesting cases in telecommunications manufacturing. A digest of his paper, *Europe's Computer Industry: Closer to the Brink*, presented at a Faculty Seminar on March 25,

1974, appears in the Summer 1974 *Columbia Journal of World Business*. He has also developed cases in manufacturing electronic components and consumer electronic goods. Hayes, a Professor of Business Administration, joined the Program's Executive Committee in 1973-74.

ARENA: ELECTRONIC FUND TRANSFER (E.F.T.) SYSTEMS

Money talks, and not only in terse proverbs.

A substantial proportion of the total information flow consists of financial transactions of one kind or another. More than one-third of all mail is checks, bills, purchase orders and the like, but the most rapid development in financial communications is in electronic fund transfer systems.

Financial institutions are among the most important of the information industries. Electronic data processing and communications have had great growth in the internal workings of banks and thrift institutions. Some of these data networks are national or even global in scale, but the extension of these systems to provide new financial services has become a matter of public controversy.

Elements of E.F.T. systems already operating include automated teller machines, credit-verification and check-guarantee systems, bank-card operations, automated clearing houses, and the Federal Reserve's Fed Wire and the private Bank Wire. Such applications have been compared with mailboxes or telephones by the U.S. Comptroller of the Currency. Does this mean they should come under the FCC? The Postal Service? Representatives of both organizations have been named along with banking officials as members of the National Commission on Electronic Fund Transfers created by Act of Congress in October 1974. Many states have already enacted laws designed to regulate E.F.T. systems.

The Program has sponsored four studies in this arena.

DIALING FOR DOLLARS

FCC Commissioner **Robert E. Lee** considers the interests of the FCC in a proposed national E.F.T. system to be operated by the Federal Reserve Board in his study, "Dialing for Dollars". Lee argues that the communications aspects of these systems are often overlooked and that procedures devised for regulating communications may provide a model for regulating E.F.T. systems.

Lee notes the many resemblances of E.F.T. systems to communications common carriage. He states that bank-to-bank E.F.T. systems very closely resemble the "hybrid communications services" the FCC regulates under rules established after its *Computer Inquiry*. Lee does not say that the FCC should regulate E.F.T. systems, but he does argue that many issues already adjudicated by the FCC are germane to a national E.F.T. system as well.

The system will be an important resource to the financial systems with access to it. Who should have access? Bank members of the Federal Reserve System only? Savings and loan associations? Credit unions? How should users be charged? The FCC has already

developed rules for assuring fair access to communications systems and for establishing rates, both for monopolies and competitive systems. These rules and mechanisms should be considered as models for E.F.T. regulation, Lee argues.

Lee also examines in his paper the issue of "foreign attachments" to the telephone system and E.F.T. systems. He concludes that because most banks do not cross state lines, any possible E.F.T. issue is subsidiary to the question of contradictions between state and FCC regulations on interconnection, although settlement of these issues will have an impact on the kinds of E.F.T. systems that can be adopted.

Research for Lee's paper was done by Daniel Prives, who worked on Lee's staff under the guidance of the Program. Prives was supervised by Sidney Goldman, then on Lee's staff and now with the White House Office of Telecommunications Policy.

Lee is now serving as the FCC's representative on the National Commission on E.F.T.

THE EXPLOSION OF STATE LAWS COVERING E.F.T. SYSTEMS

Banking and financial institutions are regulated both by the states and by the federal government. Some 24 states have passed laws governing the operation of E.F.T. systems. Most of these laws were passed in 1975 after the Federal Home Loan Bank Board and the U.S. Comptroller of the Currency began encouraging savings and loan associations and banks to look to E.F.T. systems for their future operations. The Comptroller issued a ruling that off-premise E.F.T. facilities, such as automatic tellers, were not branch banks, but asked banks to hold off implementation until the states had had time to act. The Comptroller's ruling was subsequently nullified in court, but the states acted and most of the laws are still on the books.

Daniel Prives spent the summer of 1975 examining these laws. Most of them concern themselves primarily with questions of bank cooperation in developing E.F.T. systems, and with fitting E.F.T. systems into existing branch banking regulation. Most of the states permitting branch banking have passed E.F.T. laws. Prives also found a correlation between E.F.T. laws and states with large numbers of thrift institutions (S&L's, mutual banks, and credit unions).

Most of the laws either permit or require banks to share in the development of E.F.T. systems. Prives found confusion of purpose in these laws. Permission to share implies that the financial institutions want to do so, but requiring them to share implied that they do not.

He also found a lack of clarity in these laws as to what was to be shared and with whom. Some states permit banks to share only terminal facilities, such as might be installed in a retail store for rapid credit checks or disbursements from customer's accounts, but other states permit or require the sharing of switching facilities as well. This can have the effect of making a communications regulator out of the state banking commissioner. Most states have no other enforcement mechanism.

Provisions for rate-setting mechanisms are for the most part vague or non-existent, and often these laws do not make clear whether sharing means among banks only or among banks and thrift institutions. The involvement of non-financial institutions in E.F.T. systems is ignored by most state laws, although both the Post Office and Western Union already offer explicit fund-transfer services and large data-processing operations are also ready to go into

the business, or, like national credit card systems, are already nearly in it. (See also the Brackbill study below.) Prives found that these laws tended to preclude any out-of-state involvement in E.F.T. systems, identifying such involvement with out-of-state branch banking regardless of its actual form. Concrete consumer-protection or privacy provisions are rare.

Prives traces most of the problems he found in state E.F.T. laws to a lack of clear policy direction —

Why should they share, or not? — and to a lack of understanding of the technology involved. Most of the states reacted hastily to federal pressure and tried to fit what they knew then about E.F.T. into pre-existing state laws governing bank competition and cooperation.

Prives is in the fourth year of a program leading to a combined degree in law and business administration at Harvard. His paper is available as a Program publication.

E.F.T. POLICY AND NON-FINANCIAL INSTITUTIONS

Banks and thrift institutions are not the only institutions interested in moving money around and interest in E.F.T. is not limited to them either. As mentioned above, the Postal Service and Western Union are already involved in funds transfer and there is no reason to believe their interest will lessen. Retail chains are also intensively involved. They use automation at the point of sale, extend credit to consumers, sell insurance, cash checks, and prepare tax returns. Some even accept savings deposits and make loans. Data processing networks are already processing credit verifications and other bank transactions, and financial services like American Express and the two national bank-cards might see E.F.T. services as a logical extension of what they already do, as might national service chains for hotel, airline or automobile reservations.

These services can avail themselves of E.F. T. technology to offer an array of traditional and new financial services in competition with banks and thrift institutions that might extend or even replace existing financial services. Among the elements which will structure this coming financial service industry are the laws and regulatory decisions which are (and are not) now being framed.

Charles L. Brackbill, Jr., a student at Harvard Law School, is studying the role of non-financial market players in E.F.T. development. Brackbill is identifying these players, characterizing their interests and intents, and determining how they are influenced by and are influencing state and federal laws and regulatory decisions. Brackbill is also keeping up the compilation of E.F.T. laws, statutes, court decisions, and regulatory actions begun by Prives.

PRESENT AND FUTURE LAWS AND E.F.T. SYSTEM DEVELOPMENT

What aspects of E.F.T. system development can be handled by the judiciary under existing statutes? What new questions do E.F.T. system developments present for legislative or administrative resolution?

This paper by **Daniel Prives** addresses these questions. The focus is on the federal McFadden Act, which permits national banks to have branches only if state banks may branch under state law.

Recent court cases have almost uniformly held that the McFadden Act applies to E.F.T. systems. The courts have reasoned that the Act is intended to establish competitive equality between state and national banks. Prives studied Congressional debates when the act was passed, however, and found that the intent was rather to prevent large banks from acquiring small banks as branches. Congress was concerned with the active threat of a swift and certain transformation from a system of unit banks to a sys-

tem of centrally controlled banking institutions. It was never the intention of Congress to prevent any changes in banking (such as E.F.T. systems) which might lead to long-term evolution of the structure of the banking industry.

Prives argues that Congress, in writing the McFadden Act in 1927 (and revising it in 1933), could not have foreseen that competition for consumer accounts would become a characteristic feature of banking in the 1960s and 1970s. Thus, it is unlikely that Congress intended the McFadden Act to cope with a fundamental change in the nature of banking.

Prives concludes that existing statutes on branch banking have little relevance to retail E.F.T. systems, but that such systems are part of a new environment in banking that raises new issues for scrutiny by policy-makers.

The blurring of once-clear distinctions is not confined to the communications arena. All information systems are becoming compatible with each other in principle, including the public communications media — magazines, the press, publishing, cable TV, movies, and broadcasting. Problems with the Communications Act of 1934 will pale beside problems with making the First Amendment match up with modern information resources.

Both broadcasters and press-wire services are dependent on the telephone system for nationwide distribution. Computer-controlled editing and typesetting are commonplace. Movie and television production and distribution have moved in together. Cable television is the beginning of a process that could put them all on the same telephone wires. As the case of cable illustrates, however, technological possibilities don't swing as much weight as institutional realities.

The Program has nine projects thus far in this arena, which also has broad relations to the other interests of the Program.

NEW PERSPECTIVES FOR NEWS EXECUTIVES

News is one of the oldest information industries, so old that it is hard to think of gathering and telling the news as information processing at all. The news is too vital — and the deadlines come too fast — for most of those involved to look at the news industry as it fits in the larger arena of information resources. But the news is too vital for those involved *not* to be aware of how it fits with the other, competing information industries.

The Nieman Foundation for Journalism has joined with the Program in preparing an educational forum which will help news executives from wire services, broadcasting and newspapers confront the rapid changes in the information industries with a wide perspective grounded on solid facts. The first sessions will be held in spring, 1977, and will involve Program researchers, Nieman Fellows (broadcast, wire and print reporters), and news executives.

This Executive Perspective-Building Forum will begin with a one-week workshop providing background in the technological, economic, legal and political events affecting the information industries. Once this base of common knowledge is built, the executives will be able to set some of their own priorities for future involvement. Some will stop with the workshop, but others may want visiting fellowships to explore specific policy options or corporate strategies with members of the University over a longer period. We expect that several research projects for the Program will emerge from these interactions and it is likely that some executives will become Program researchers.

If this program for news executives proves fruitful, the Program will offer similar opportunities at Harvard for executives of other industries as well.

MERGING MEDIA AND THE FIRST AMENDMENT

The Common Carrier Bureau of the FCC may have more impact on the nation's news and entertainment media than the Nielsen ratings or the courts, but it is almost unknown and undiscussed by them. In an address to the Nieman Assembly — Nieman Fellows, press and broadcast executives, judges and lawyers — **Anthony G. Oettinger** introduced the Common

Carrier Bureau and some other problems in information policy to some of the people who will have to deal with them. His lightly edited speech has been reprinted as a Program working paper with the permission of *Nieman Reports*. It is titled *Merging Media and the First Amendment*.

INFORMATION LOGISTICS AND LOCAL NEWS

Newspapers are information systems, gathering and processing data, packaging and transmitting it. In a Program working paper, *Information Logistics and the Local Delivery of Information*, **Wallace P. Wormley** treats the local newspaper as an information product in an unstable state. This is because some of its traditional functions are being fulfilled by others and its markets are under challenge. Linkages and mergers among technologies are commonplace even in this traditional business, and the available means for distributing local information are growing more indistinguishable and interchangeable.

CATV AND COMMON CARRIAGE

In 1973, **Paul Berman** began studying jurisdictional issues in CATV in the request of the Massachusetts Community Antenna Television Commission. He continued the work in 1974-75 under the joint guidance of Donald Trautman, Professor of Law at the Law School, and the Program.

His paper, *CATV Leased Access Channels and the Federal Communications Commission: The Intractable Jurisdictional Question*, traces the history of FCC assertions of jurisdiction over CATV systems and facilities, developing the hypothesis that the jurisdictional question is as elusive today as it was fifteen years ago when the FCC and the courts first ad-

Wormley first examines current trends favorable and unfavorable to the newspaper industry and then surveys technological developments that may affect the local delivery of information products.

Wormley graduated in psychology and physics from Howard University and holds a Ph.D. in psychology from Harvard. He held a joint appointment as a research fellow with the Program and the Business School during this research project. He is now in the Bond and Loan Department of the Prudential Insurance Company.

ressed it. He notes that, in all significant attributes, leased-access channels serve the function of communications common carriage, and proposes that their regulation be considered explicitly in that light. FCC assertions of jurisdiction over these channels are compared to similar assertions over communications common carriage. Examination of the issues raised by this comparison leads to the conclusion that Congressional action on the jurisdictional issue is necessary.

The paper appeared in December 1975, in the *Notre Dame Lawyer*, Volume 51, No. 2.

DETERMINANTS OF FCC DECISIONS

Richard Berner has completed a study of the forces which shape the FCC's cable regulatory process. After analyzing salient decisions in the history of cable regulation, Berner focuses on the most recent cable rules. He analyzes in detail the industry groups' "consensus agreement" which successfully altered the Commission's choice of cable regulations. He suggests that, as a result of the process fostered by this "agreement", "extra-agency groups were able to determine FCC outcomes by so structuring the Commission's options that their choice became that which . . . best served the combined interests of these extra-agency groups".

Berner then proceeds to analyze the process by which the Commission implements its cable rules. He notes that here intra-agency forces seem to shape FCC decisions. Citing James Q. Wilson's observation "If the agencies have been captured by anyone it is probably their staffs", Berner analyses the role of the Cable Television Bureau in the rule enforcement process. Contrary to traditional views of administrative behavior, Berner maintains that the Cable bureau has a direction and purpose distinguishable from the Commission as a whole. Using several case examples to demonstrate his argument, he shows how by using its control over information and other dele-

gated responsibilities, the Cable Bureau is able to influence the rule enforcement process.

Berner's interest in the cable situation began in the spring of 1973 while he was working in the office of then FCC Commissioner Nicholas Johnson. His first paper on the subject was prepared for the Program that summer. His research became his senior thesis, *Constraints on the Regulatory Process: A Case Study of Regulation of Cable Television*, which was rated *summa cum laude* upon his graduation in June 1974 by a committee comprising William M. Capron, lecturer

on Political Economy and Associate Dean of the Kennedy School of Government; Dan H. Fenn, lecturer on Business Administration and Director of the Kennedy Library; and Irene Taviss Thomson, then lecturer on Sociology.

The thesis was revised under Program guidance and issued as a Program publication. A later version will be published this winter under the same title by Ballinger Publishing of Cambridge. Berner is now a student at Columbia University Law School.

THE FCC AND BROADCAST INNOVATIONS

When the FCC was established, AM radio was the only broadcast medium, but since then the Commission has taken on the regulation of VHF television, FM radio, UHF-TV, CATV, and pay television without any change in the law. **Vincent Mosco** has drawn on previous Program research as well as his own work to produce two studies of the FCC's absorption of these innovations. As it turns out, the FCC's response was to treat each new service as ancillary to the form of broadcasting dominant at the time the innovation was introduced. He came to the conclusion that traditional notions about rational decision-making did not seem to apply.

Mosco argues that the urge to simplify a complex situation drove the FCC rather than pressure from the broadcasting industry and Congress, or

pressure from FCC policy goals or staff bureaus.

The major portion of Mosco's work was done for a doctoral thesis in sociology. The Program has published the thesis under the title, *The Regulation of Broadcasting in the United States: A Comparative Analysis*. In the thesis, Mosco reports on and discusses the absorption and adaptation of each innovation in doctoral detail.

Mosco has also written a separate publication, *Reforming Regulation*, which summarizes his findings in more accessible form and with particular reference to what can be said about the making of future policy.

Mosco is chairman of the sociology department at Lowell University and a research fellow of the Program.

STATE REGULATION OF CABLE TELEVISION

Cable television is a political issue in each of the 50 states. At least a dozen have enacted formal regulations on cable TV and others have such regulation under active consideration. The others have left regulation to the federal government and local communities while waiting for the dust to settle or some pattern to emerge on the state level.

Connecticut, Massachusetts, Minnesota, New Jersey, and New York, among others, already have state regulation. California, Illinois, Michigan, Pennsylvania, Texas, and Wisconsin are some who are actively considering legislation. **Morton H. Aronson** and **Kas Kalba** plan a study of both regulated and unregulated states.

The issues involved are of several kinds, including:

- Public policy. Should states become involved at all, since federal and local governments have preceded them? Will further regulation be redundant with a deleterious economic impact, or is it vitally necessary to consumer protection despite any drawbacks?
- Legal and organizational issues. Should a state's public utilities commission assume the cable regulatory role, as in Connecticut, Nevada, and elsewhere, or should an independent body be established, as in Massachusetts, Minnesota, and New York? Should regulatory bodies do more than regulate? Should they perform state telecommunications planning, advise localities on cable, operate demonstration projects?
- Specific regulatory issues. Should states set rates? In what manner? To what degree do they or should they preempt or complement local regulators?
- Impact issues. Does state regulation help or hinder cable growth? Does it alter the relationship of localities to local system operators?

How does it affect consumers? Does it lower costs? Improve service Quality? How does it affect the cable industry?

Aronson and Kalba plan to compare the outcomes of legislative decisions and regulatory practices of the eleven existing state cable agencies with outcomes in other states without regulation. Different forms of regulation will also be compared. The result will be a book analyzing the legal options and policy implications of different possible courses of state cable action.

LOCAL REGULATION OF CABLE TV

Cable television is regulated not only by the FCC and some states, but also by local governments. Prescriptive literature on what the behavior of local regulators should be is abundant, but much less has been written about what their behavior has turned out to be.

In his Program publication, *City Meets the Cable: A Case Study in Technological Innovation and Community Decision-Making*, **Kas Kalba** addresses this problem. His report is based on his case study of Cincinnati's decision to postpone wiring the city for cable TV. He compares the results with decision-making in other

Aronson was the first chairman of the Massachusetts Community Antenna Television Commission. Formerly an attorney with the Boston firm of Grabill and Ley, he is now with Federated Department Stores, Inc., in Cincinnati, Ohio. Kalba is president of Kalba Bowen Associates and a Visiting Lecturer in the Department of Political Science at M.I.T. Kalba has been with the Program since the beginning. He chaired the planning committee that developed the Program's original direction.

large cities and analyzes several suggested approaches to cable development. This analysis is made in the light of how decisions are actually made at the municipal level.

The report examined the nature and limitations of municipal control over technological innovations and assesses cable development options in the context of federal and state regulatory policies.

Much of the information gathered in this project was used in Kalba's doctoral dissertation in City Planning at the University of Pennsylvania.

THE REALITIES OF CABLE TELEVISION

The endemic problems of the CATV industry are analyzed by **Anne W. Branscomb** in her article, *The Cable Fable: Will It Come True?* which appeared in the Winter (1974-75) issue of the *Journal of Communication*. She was formerly communications counsel for the TelePrompTer Corporation and she takes that firm's financial crisis of late 1973 as a case in point. She directs attention to blue-sky promises, unskilled personnel, lack of programming or new services, lack of venture capital, and overregulation by local, state and federal governments. Her proposals for new pol-

icy directions include cooperation with existing industries for developing new services; encouraging cross-investment by one industry in the development of another; divorce of control over content and conduit; more local and regional planning; and commitment of public funds for investment in cable hardware and software.

Branscomb is now vice president of Kalba Bowen Associates, Inc. Her paper is available as a Program publication.

Librarians can trace their profession back thousands of years, but the public library is a modern institution, contemporary with the telegraph and the telephone. The first public libraries were opened late in the 18th century, but the movement to make information resources available to the general public through libraries did not take off until the middle of the 19th century. Today, libraries are struggling to remain contemporary and public despite new pressures and old problems. The Program has conducted one study in this arena.

LIBRARIES AND INFORMATION POLICY

The nation has many information resources. The challenge is how best to marshal these to meet the needs of the people. The choice between private and public instruments is not crucial. What matters is how funds flow and who benefits from them, how unique information resources are best exploited and how the conflicting ideals of equal opportunity and of local or private decision-making are accommodated.

Costs in this field have risen more rapidly than elsewhere. At issue is whether growth in services should and can be sustained and how costs might be controlled. Accounting and pricing practices are poor, however, and better support for management and policy decisions is essential. The equity of subsidy and cross-subsidy practices, long at issue in postal and telephone services, is of growing importance in the realm of library and other information services.

Anthony Oettinger examined this area under a

Program contract with the National Commission on Libraries and Information Science. The resulting report, first issued in February 1975, looks at relationships among information providers and their clients in order to mark the economic, institutional and technological factors that are key in deciding how people get the information they need. It focuses particularly on the private sector information industry and the library world.

A considerable amount of data is assembled, including 78 figures. The findings point to issues that are complex and persistent, although their manifestations often change rapidly.

Oettinger concludes that the public has benefited unevenly from both private and public information services. Planning for such services has generally failed to take into account the full spectrum of demands and constraints that affect the outcome of any plans.

Oettinger is the Director of the Program.

ARENA: EDUCATION

Schooling is one of the largest of the information industries, more than three times the size of the telephone industry. Control of education is one of the most potent of political issues. Most of education is subject to public policy, but private industry is doing more and more of its own teaching.

There is a growing realization that it is hard to perceive learning needs adequately, hard to assess the value of technology for learning, and hard to deploy people, processes, and tools effectively. At the same time, the pace of decision-making that will shape patterns of learning for decades to come is quickening. Decisions critical to education are being made in the entertainment,

computer, and telecommunications industries, as well as in traditional educational circles. The government agencies most directly involved in these decisions are not charged with responsibility for learning. The issues are being shaped and settled by narrow, disparate interests, without widespread public knowledge or debate. The Program has undertaken two studies in this arena.

WILL INFORMATION TECHNOLOGIES HELP LEARNING?

In one of the Program's earliest research projects **Nikki Zapol** and **Tony Oettinger** surveyed the entire range of information issues in education, from computer-assisted instruction (CAI) to copyright problems of electrostatic copying. The resulting essay, "Will Information Technologies Help Learning?", appeared in *Content and Context: Essays on College Education* (McGraw-Hill, 1973), which was edited by Carl Kaysen for the Carnegie Commission on Higher Education chaired by Clark Kerr. It has also been widely reprinted.

Among the topics discussed are the impact of technology on the evolution of the university, the mails and CATV in learning, censorship, the textbook market, record piracy, and library and publishing issues.

Oettinger is the author of *Run, Computer, Run: The Mythology of Educational Innovation* (Harvard University Press, 1971).

INFORMATION ISSUES IN EDUCATION

Quite different processes determine the information content of educational broadcasts, textbooks, and computer-assisted instruction. The commercial, legal, financial, and regulatory frameworks of these educational media differ widely, as do the relationships among the participants in the flow of information from creator to user. Patterns of social control of information usage are strikingly dissimilar.

What changes may we expect in the relative usage of these media, whether in school or in less formal learning situations? How are these changes likely to affect control over learning? Who are the policy-makers and what are the options? What are the likely consequences of this situation for which learners? For which industries?

Paul DiMaggio and **Nikki Zapol** examined the processes by which books, broadcasts and CAI materials are brought into educational settings, and how differences in decision-making patterns in these media are reflected in the substance transmitted to learners.

How are decisions made to publish or produce these materials? How are materials selected by school systems? How do materials reach the learner? How are the materials used by teachers? How do these decisions affect one another in the marketplace and the political arena? How do private and government funds affect these processes? Preliminary findings in this area are presented in a Program working paper,

"Information Technologies and Control Over Learning".

The paper traces the full pattern by which instructional materials are prepared for textbook and/or broadcast distribution, and summarizes the project's research to date. Also included in the working paper is a reprint of an essay describing education in private industry, where CAI has flourished, compared to its general flop in public education.

In their preliminary work, the authors have benefited from the advice and criticism of Laurence H. Tribe, a Professor of Law, whose interest in how the choice of means for reaching desired ends can shape basic values of society was the original stimulus for this study. They have also worked closely with Paul Berman and Irene Taviss Thompson, Assistant Professor of Sociology at Fairleigh Dickinson University and a consultant to the Program. The authors also interviewed widely in broadcasting and publishing.

DiMaggio majored in sociology at Swarthmore College and is a graduate student in sociology. He was co-chairperson of the *Harvard Educational Review*. Zapol was one of the first members of the Program staff and has worked as a consultant to the Academy for Educational Development. She is now a third-year student at Harvard Law School.

The market for information systems and services is offering more and more alternatives that are both useable and affordable for the individual corporate manager. On the personal level, the hand-held calculator has brought increased computational capacity to every desk, changing the relation between the individual and the large central computer. At the same time, the more centralized systems have been made more useful to individuals by means of low-cost terminals for communications and visual display.

On the corporate level, the trend is toward large systems that will serve the whole organization and also allow quick individual access to massive data and report-generating resources. Moreover, corporate information needs have become world-wide with the growth of international, multinational and transnational corporations.

Management and corporate communications make a major contribution to the national and international flow of information, but they can also be the source of political difficulties within the corporation, or within the national and international political environment. The Program has two ongoing studies in this arena.

HOW DO ORGANIZATIONS LEARN? THE ROLE OF MIS

An organization learns like everybody else does, by gathering and absorbing new information about itself and its surroundings. Managements devise management information systems (MIS) to help them learn, but research by **Chris Argyris** suggests that the "official" MIS must recognize the hidden contradictions and wrong-footed learning processes embedded in the organization in order to be effective.

Argyris is working in the context of his studies in organizational learning as reported in his book, *Theory in Practice*.

In a Program working paper, *Organizational Learning and Effective Management Information Systems: A Prospectus for Research*, published in May 1976, Argyris sets forth some of the ways MIS can help or hinder. Argyris concentrates on the sources of error in MIS. What the production department needs to know about itself in order to operate can be very different from what top management needs to know about production. Each has secrets from the other;

some should be kept secret and some should not. Doing well in the organization is not always the same as doing well for the organization.

Argyris gives three objectives for his research program:

- To develop a diagnostic technique to determine how MIS could be effective in an organization.
- To find out why MIS disappoint their creators or users.
- To design new MIS that can overcome counterproductive forces and raise the level of managerial effectiveness.

Argyris is presently seeking research settings. He hopes to begin empirical work by comparing MIS that are regarded as exemplary with unsatisfactory MIS and with a system still being designed.

Argyris is James Bryant Conant Professor of Education and Professor of Organizational Behavior at the Schools of Education and Business respectively and a member of the Program's Executive Committee.

BRINGING IN OUTSIDE INFORMATION SERVICES

Sometimes the sheer bulk of corporate information needs, or their geographical spread, makes it necessary to bring in outside vendors for both communications and information processing and storage. External systems and data bases are also sold to corporations and managers by outside organizations. These companies sell access to systems providing planning and analytical capabilities, and to information which is accumulated, abstracted, indexed and reported for many different corporate and government users. This segment of the information industries is very young, but growing in interest and importance.

John Austin is preparing a study of the corporate use of external information systems provided by organizations selling software capabilities and processed information as products. The study will have three elements:

- Preparation of a descriptive catalog of major vendors and services with a cross-referenced index.
- Development of criteria for "effective" use of external information services.
- Study of four to six corporations using external information service.

The published results of this research should tell the corporate manager the circumstances that call for going outside for information services and tell the service vendors what characteristics their potential corporate clients are likely to have.

Austin has been conducting a seminar on management uses of computer-based information services at the Business School for the past seven years. His research interest developed from his observation of the tension between the information needs of the individual manager and the traditional information requirements of the corporation, tension that inhibits effective planning. This study is part of his long-range research on corporate information needs of the 1980s.

ARENA: PRIVACY AND ACCESS

- If *we* know enough about *everything*, we can get ahead, win, preserve, conquer, make money, learn, do good, and so forth.
- If *they* know enough about *me*, they can take me away, take away my property, laugh at me, tell my family, tell everybody, make me stop, cost me money, etc.

The emergence of new information technologies has revived and reinforced these tensions that naturally exist between individuals and their society. Since the organization of society consists in large part of the organization of information, there will be continuing pressures for access to various kinds of information. The government — FBI, IRS, USPHS, CIA, LAPD — want to know what's going on with you, and so do private credit and financial agencies, news reporters, and insurance companies. On the other hand, even the hypothetical citizen with nothing to hide does not care to have his life open to any inquirer who might take a look. These conflicting impulses are expressed in ancient and modern laws, new court decisions and old rallying cries. The Program has thus far conducted three studies in this arena.

THE RIGHT TO PRIVACY IN AMERICAN HISTORY

David J. Seipp is examining the origins of the legal concept of a right to privacy in late 19th century America. In this period, a broad-based demand for the regulation of government and business information activities arose in the name of a right to personal privacy. This demand set in motion public policy processes putting privacy against such older competing values as effective law enforcement, equitable social services, and freedom of the press.

Seipp's research is concentrated on three areas in which the assertion of a right to privacy resulted in a new balance of interests. These are:

- Legal battles over the sanctity of person-to-person communications through the mails and the extension of this government protection to private telegraph and telephone lines.
- Opposition to ever more extensive census questions from businessmen, the medical profession, and the general public which led to a government promise of confidentiality for cen-

sus data that could be identified with individual respondents.

- Lawsuits attacking the yellow press for invasion of privacy in the sensational society reporting of the 1880s and 1890s which resulted in the first assertion that courts could award damages on the basis of a legal right to privacy.

In each general area, privacy and individual freedom remain counterposed to law enforcement and national security, equitable social services, and freedom of expression. The legal formulations of the era survive in the statutes and precedents now being applied to electronic surveillance, computerized information systems, and modern mass communications. More importantly, the conflicting value systems remain, and the way they were balanced then can inform the current policy debates on privacy.

Seipp is an undergraduate majoring in history at Harvard. This project is scheduled for completion in Spring, 1977.

PRIVACY AND THE REGULATION OF INFORMATION SYSTEMS

David Seipp has prepared a status report and bibliography on the regulation of information systems handling personal data. The report covers a dozen areas in and out of government. Included are the census and social science research, arrest records and surveillance, IRS investigations and disclosure of tax returns, medical records and physician privacy, personnel files, mailing lists, and school records. Particular attention is given to federal legislation: the Freedom of Information Act, the Privacy Act of 1974, the Fair Credit Reporting Act of 1970, the Bank Secrecy Act of 1970, the Buckley Amendment to the Family Educational Rights and Privacy Act of 1974,

as well as to other relevant federal statutes and state laws.

Seipp's report outlines the legislative history of the statutes and the positions of individuals and organizations supporting or opposing regulation in these areas. Also supplied are relevant court decisions, surveys, hearings, and recommendations on privacy and disclosure. The report closes with a bibliography of more than 1000 items.

Seipp's study is addressed to owners, users, and subjects of personal information systems that are or soon may be under government regulation.

THE COSTS OF PRIVACY

Robert C. Goldstein has explored the operational and financial implications of databank-privacy regulation. His book, *The Cost of Privacy*, was published early in 1975 by Honeywell Information Systems, Inc.

Goldstein acknowledges the rapid growth of personal data systems and the drive toward regulating them, pointing out, however, that regulation will entail additional costs that may impede the operation of the systems or the attainment of regulatory goals.

He devises and illustrates practical techniques for assessing the costs of different types of regulation and for projecting their implications.

The book grew out of Goldstein's doctoral work at the Harvard Business School, which was directed by Professor Richard L. Nolan, with cooperation by the Program. Goldstein is now Assistant Professor of Commerce and Business Administration at the University of British Columbia in Vancouver.

ARENA: BASIC METHODS AND DATA

The Program does not aspire to be the only one in its field. We draw on the work of others and we expect them to draw on ours. We have attempted to put together some basic information on information resources and policy processes that will be useful to researchers in our Program and outside it.

THE PROCESS OF LEGISLATIVE COMPROMISES

The making of legislative and other public policy compromises is little understood. To outside observers, some legislative compromises seem to endanger cherished principles, while others seem purely cosmetic to attract a few additional votes. Public policy compromises relying partly on competition and partly on regulation often are faulted by those who prefer exclusive reliance on one or the other. **Kurt Borchardt**, retired legal counsel to the Committee on Interstate and Foreign Commerce of the U.S. House of Representatives, and a consultant to the Program, has written *Towards a Theory of Legislative Compromise*.

In his paper, Borchardt argues that compromise is an essential element of legislation, except in those rare instances where polarized positions command overwhelming public support. His argument is supported with extensive examples from his own Congressional staff experience. Borchardt notes that regardless of the subject being legislated, interactions among three factors determine the chances of passage. They are the individual "style" of the legislators who play leadership roles regarding the legislation under consideration, the institutional setting, and the subjective assessments these legislators make of the issues. He concentrates on this last point, ar-

guing that in order to enhance chances of passage, legislators seek to avoid sharp, polarized issues and search for subtly shaded information on the issues which will tend to reduce their "voltage."

Issues in appropriation legislation, he argues, are naturally low voltage because the information pertaining to such issues has already been explored in authorizing legislation and because quantities of money can readily be increased or decreased. Everyone already knows what the Agriculture Department is authorized to do, and the decision involves merely whether it should do more or less.

Sometimes it is possible to lower the voltage of issues through imaginative use of legislative skills. While the issue of *federal aid* to schools of public health was sharply divisive when introduced in Congress in 1946, a bill *reimbursing* the schools for expenses incurred in connection with Federal training programs of public health personnel passed easily.

Controversial policy objectives frequently are attainable by resorting to elaborate forms of administrative arrangements designed to achieve wanted objectives by indirection, and the paper cites numerous examples.

BIBLIOGRAPHIC TOOLS

Carol Weinhaus has edited bibliographic contributions by many Program participants and colleagues in other organizations into the working paper *Bibliographic Tools*, first issued in January 1974, and most recently updated in February, 1976.

The current edition is in two volumes. Volume 1 has four sections: a reference guide, an annotated bibliography, a guide to background articles on science and technology, and a guide to audiotapes and videotapes. Volume 2, subtitled *Legislative Guide*, contains guides to federal agencies and departments, and also sections reprinted from Don R. Le Duc (University of Wisconsin, Madison, Wisconsin) "In-

side the FCC: a Guide for Information Seekers," and from LeDuc and Erwin Krasnow (Kirkland, Ellis and Rowe, Washington, D.C.) "Broadcast Legal Documentation: A Four-Dimensional Guide."

This document has proved valuable as a research tool and as an aid to students in Program-affiliated courses. Copies have been requested by several organizations outside the University.

A small, specialized Program library, comprising government documents, specialized reports not published conventionally, and other fugitive materials, is also being gathered by Weinhaus.

A ROUGH CENSUS OF THE INFORMATION INDUSTRIES

Warren Lavey has made a rough census of the information/communication industries, with preliminary attempts at comparisons in size. It covers television (broadcast and cable), radio, telephone, domestic telegraph, the Postal Service, newspapers, book publishing and printing, periodicals, motion pictures, and computer services and software. Lavey's full report has been issued as a Program Publication under the title *Toward a Quantification of the Information/Communications Industries*.

Carol Weinhaus, of the Program's staff, is continuing this project with the assistance of **Larry**

Beyer. They are extending Lavey's snapshot data into time series and developing descriptions of additional industries. This work is available to the Program's researchers and has been used in many projects, but it has not yet been published separately.

Lavey completed his combined bachelor's and master's degree program *summa cum laude* in June 1975. He continued his studies on a Rotary Foundation Fellowship at Cambridge University, England, and has been working on long range telecommunications studies at the British Post Office.

ARENA: MISCELLANEOUS

In an imperfect world, not everything has its proper arena. As an imperfect research program, we accept this, and find that some of our most interesting projects do not fit our own categories.

TRANSPORTATION, COMMUNICATIONS AND HEADQUARTERS LOCATION

Warren Lavey has broken new ground in using Dun's Market Identifiers, an extensive Dun & Bradstreet computer database, to measure *empirically* how much considerations of transportation and communications influence decisions on where to locate corporate headquarters in manufacturing firms with a number of plants. His findings confirm the notion that physical closeness to the largest plant within a firm and to the headquarters of other firms is a highly significant factor in selecting a headquarters site. Lavey's paper *Transportation/Communications Considerations in the Location of Headquarters for Multi-Establishment Manufacturing Firms* is undergoing final review and revision prior to submission for publication.

How much physical closeness can be traded for

closeness achieved through telecommunications is still a matter for investigation. Evidence presented at the May 13, 1974 Faculty Seminar by Robert Auray, Director of Business Research for AT&T Long Lines, an affiliated corporation, suggests that travel and telecommunications grow together and not at the expense of one another.

Lavey's work on this subject grew out of discussions in the graduate seminar, Public Policy 283b, *Information Technologies and Public Policy*, in the spring of 1974. Under the supervision of Professors Robert A. Leone and John R. Meyer of the Business School, it continued in the summer of 1974 at the National Bureau of Economic Research, of which Meyer is president.

THE ECONOMICS OF TECHNOLOGY

Technology is frequently blamed as the source of many social problems, or attacked for the failure to ameliorate them. In an essay aimed at illuminating such discussions, issued as a Program working paper, **Montgomery Phister, Jr.**, argues that in general the problems arise because of changes in the production, distribution, and consumption of technology's goods and services. He calls these mat-

ters the substance of the economics of technology, and proposes that faculties of engineering and science should add courses in and devote research to this complex and fascinating subject. He describes a prototype study and a university course on a portion of the general subject: the economics of dataprocessing technology.

RAILROADS, COMMUNICATIONS SYSTEMS AND REGULATION

Communications regulation is in large part an adaptation of forms devised long ago for the regulation of transportation. **Richard J. Solomon** is preparing a Program working paper which looks at railroads and telecommunications, their early histories, intertwinings, analogies and current prospects.

Are the railroads in a genuine decline? Could Bell Telephone go the way of Penn Central? How have alternate technologies competed? What are the parallels between the financial structure and control

of railroads and telecommunications firms? What are the incentives for planning national policy for each? How do railroads handle costly subsidiary services, such as passengers? Who are the "passengers" in communications?

Solomon is a research fellow of the Program and staff associate at the Institute for Government Services at the University of Massachusetts in Amherst.

The Program is involved in teaching undergraduates and graduate students at Harvard and in providing text materials for use in industry, government, and at other schools.

Undergraduates in Harvard College and graduate students in the Schools of Arts and Sciences, Business, Government and Law continue to request advice and guidance from the Program. Some students have sought guidance on particular projects, others are interested in including information resources policy in their study plans. Among these, Paul Berman, Richard Berner, Larry Beyer, Charles Brackbill, Paul DiMaggio, Gordon Imrie, Arlene Karlin, Guy Loeb, Vincent Mosco, Daniel Prives, David Seipp and Wallace Wormley are participating in Program research (Section 2).

Three courses (Figure 5) are closely associated with the Program in both subject matter and participating faculty. Two are graduate seminars: one by the Public Policy Program of the Kennedy School of Government and the other by the Department of City and Regional Planning of the School of Design.

In the 1975 fall term, Oettinger took sabbatical leave to allow him time to develop a new undergraduate course, *Information Resources and Public Policy*.

In addition to the courses shown here, Program researchers, board members, and reviewers are using our research and materials in a dozen or more courses not formally connected to the Program.

The cross-fertilization between research and teaching activities leads to an overlap between Program participants and staff responsible for these courses. For example, Carol Weinhaus assisted in an earlier course, *Communication in Societies*, most notably by taking charge of the video facilities and by supervising students' video experiments. She will be instructing the students in research techniques and coordinating the mechanics of *Information Resources and Public Policy*. Paul Berman and Daniel Prives became interested in research in the Program's field as students in *Communications in Societies* and later, along with Nikki Zapol, served as Teaching Assistants and as Research Fellows. David Seipp, the most recent course participant to join in Program research, and Daniel Prives will be Teaching Assistants for *Information Resources and Public Policy*.

Interest in the Program coincides with a general rise of interest in the area of science, technology and public policy as reflected by increasing numbers of students seeking degrees in special concentrations in this area. To aid in advising students, the Program maintains a listing of related courses throughout the University and refers students to faculty members who can help them with independent study in specialized areas.

Outside the University, Program research and staff presentations are used as instructional aids in universities, industry, and government. For example, Robert S. Taylor, Dean of Information Studies at Syracuse University, ordered 20 copies of *Elements of Information Resources Policy: Library and Other Information Sources* and the Communications Department at California State University, Fullerton, ordered 40 copies of *The Regulation of Broadcasting in the U.S.: A Comparative Analysis*.

Not all our teaching is confined to the academic setting, as illustrated by American Telephone & Telegraph's request for more than 100 copies of the working paper of *The Medium and the Telephone* and the Minneapolis Star and Tribune's request for 55 copies of *Merging Media and the First Amendment*. Program research is also used as an aid in drafting legislation and defining policy, as illustrated in Figure 6, showing requests for research results from national and state commissions studying electronic fund transfer systems.

Figure 5.
**REACHING VARIED PUBLICS —
THROUGH TEACHING WITHIN
THE UNIVERSITY**

Social Sciences 106. Information Resources Policy

Anthony G. Oettinger

Information as the base of all organized activity — a resource as vital as energy or matter. How man-made information systems perform, what controls information flow, and how people get their information. Basic theories and a concrete case study: how television, newspaper, telephone, computer and other information systems intertwine in serving the public. Interplay of scientific, technological, economic, legal and political factors affecting these services. Perennial issues (quality and cost of service, incidence of economic benefits and burdens, interpretations of the First Amendment, rights to privacy or freedom of information, etc.); current policy processes and options. Critical evaluation of applications of knowledge to policy problems.

Note: Term paper in lieu of final examination; extensive research expected of graduate students in the Kennedy School of Government who elect this course.

Prerequisite: Economics 10 or elementary calculus or equivalent.

Half course (fall term). MW 2 — 3:30 p.m.

Public Policy 283b. Seminar: Information Technologies and Public Policy

Anthony G. Oettinger, William M. Capron

Public policy issues about the evolving role of information technologies (including telecommunications and computers) at all levels of government. Emphasis on the allocation of national information functions among available technologies and associated institutions (book libraries, schools, broadcast or cable TV, telephone, etc.); impact on individuals, organizations, and public policymaking; the allocative roles of public and private interests. Student development of historical or contemporary case studies on specific application areas or technologies.

Half course (spring term). Tu, 2 — 4.

**INFORMATION MANAGEMENT FOR PLANNING AND
DECISION MAKING**

Planning 242

Spring

Mr. Kalba

This course will examine planning and decision making as an information process, involving the collection, analysis, storage, dissemination, and utilization of information. Its purpose is to familiarize students with the variety of information and communication systems that can be utilized in planning and to develop an evaluative framework for selecting particular systems in relation to specific planning and decision-making activities. The course will include presentations and discussions on various conceptual approaches to the design, management and evaluation of information systems, as well as case projects by means of which students will analyze information management issues in planning and other government agencies.

4

THE FACULTY SEMINARS

In most cases, the Faculty Seminar is the first presentation of a new Program research project. Despite the title, these seminars are open to students, representatives of Program affiliates and interested members of the general public. Vigorous and free discussion is encouraged.

Only the seminars of the past year are listed here. Others are listed in previous annual reports. In all, the Program has presented more than seventy-five Faculty Seminars. Stenographic or tape-recorded transcriptions are available for most seminars on request.

October 6

State Laws and EFTS Development

Daniel Prives

October 20

The Regulation of Innovations in the Broadcasting Market

Vincent Mosco, Research Fellow in the Sociology of

Information Science and Chairman, Department of Sociology, Lowell University

October 27

The New Politics of International Communications

William H. Read, Research Fellow in Information Technologies and Public Policy

Figure 6.

REACHING VARIED PUBLICS — THROUGH TEACHING IN GOVERNMENT AND INDUSTRY

Gordon R. Worley is a member of the National Commission on Electronic Fund Transfers. John E. Backlund is Staff Director of the Illinois EFTS Study Commission.

MEMORIAL BUILDING
LAWRENCE J. HENRY
STATE OF ILLINOIS
100 SOUTH STATE STREET
SPRINGFIELD, ILLINOIS 62701



POSTAGE GUARANTEED
BY POSTAL SERVICE
PERMIT NO. 1000
SPRINGFIELD, ILLINOIS 62701

March 16, 1974

Mr. John C. LeGesse
Program in Information Technologies
and Public Policy
208 Alken Computation Laboratory
Harvard University
Cambridge, Massachusetts 02138

Dear Mr. LeGesse:

I have received a complimentary copy of Daniel Prives' paper, "The Explosion of State Laws on EFTS," through the efforts of Mr. Keith Brown at the First National Bank of Chicago.

The Illinois EFTS Study Commission is making an investigation into this area and will be making specific legislative recommendations to the Illinois General Assembly. Obviously Mr. Prives' thoughts on the matter are relevant to our study. Due to our very sparse appropriation, we must economize wherever possible. Would you suggest if we send 20 photostatic copies of the booklet and distribute it to Commission members and staff?

Thank you.

Sincerely,

John E. Backlund
John E. Backlund
Staff Director

JEB:WIA

cc: Keith Brown

P.S. I am sending the original on to Keith.

MEMORIAL BUILDING
LAWRENCE J. HENRY
STATE OF ILLINOIS
SPRINGFIELD

GORDON R. WORLEY
STAFF DIRECTOR AND PRESIDENT
COMMITTEE

March 15, 1974

Mr. Anthony G. Getzinger
Director, Program in Information Technologies
and Public Policy
Harvard University
Cambridge, Massachusetts 02138

Dear Mr. Getzinger:

I want to thank you very much for sending me a copy of the pamphlet "The Explosion of State Laws on Electronic Fund Transfer Systems" written by Daniel Prives and dated January, 1974. I found it most interesting and helpful, and I have encouraged Mr. Jack Benson of the National Commission to leave copies for the entire membership.

The problems of state legislation as it relates to being created do not relate solely with banking, but are interesting in many instances all of the parties involved.

Again, thank you for your courtesy.

Sincerely,

Gordon R. Worley
Gordon R. Worley

MEMORIAL BUILDING
LAWRENCE J. HENRY
STATE OF ILLINOIS
SPRINGFIELD

November 3

The Postal Service as a Communications Medium in the Future

John F. McLaughlin, Director, Office of Long Range Policy Plans, U.S. Postal Service

November 10

The Newspaper Business - Its Prospects and Problems

Jules Tewlow, Director of Special Projects, Lee Enterprises, Inc.

November 17

Information Problems in Health Care Markets, and Health Policy

Michael Spence, Department of Economics

November 25

Information Distribution as a Subset of Logistic System Design Problems

James L. Heskett, The 1907 Foundation Professor of Business Logistics

December 2

From Telephone Company to Telecommunication Community - Some Problems of Adaptation in the U.K. and the USA

Michael Tyler, Loeb Fellow in Advanced Environmental Studies

December 15

The FCC and the Public

Barry Cole, Adjunct Professor, Indiana University and Former Consultant to FCC Chairmen Burch and Wiley

February 9

Who Benefits from Communications Development in Third World Countries

John H. Clippinger, Research Fellow in Information Technologies and Public Policy

February 23

NTIS - A Mixed Public-Private Information Enterprise

William T. Knox, Director, National Technical Information Service

March 1

Designing Management Information Systems to Enhance Organizational Learning

Chris Argyris, Professor of Education and Organizational Behavior, Schools of Education and Business Administration, Harvard

March 8

Computer-Assisted Research - A New Tool for the Legal Profession

Jerome S. Rubin, President, Mead Data Central

March 15

Interdependence and American Power - A New Framework for International Telecommunications

Joseph S. Nye, Professor of Government, Faculty of Public Administration

March 22

National Information Systems - Roles of the Public and Private Sectors

Melvin S. Day, Deputy Director, National Library of Medicine

April 5

Organizational Approaches to Information Processing: Are We on the Right Track?

Richard Etzi, Assistant to the Vice President, American Can Company

April 12

Technical Implications of Privacy

Arthur A. Bushkin, Manager, Privacy Projects, System Development Corporation and Consultant, Senate Government Operations Committee

April 19

America Answers the Call: The Culture of Telephone 1876-1926

Sidney H. Aronson, Professor, School of Social Science, Brooklyn College of the City University of New York

April 26

Information Logistics - Local Delivery of Information

Wallace Wormley, Research Associate in Business Administration

Capron, William M.

March 29, 1976

Comments on Telecommunications Policy Developments, presented at the Aspen Institute Program on Communications and Society meeting, Brookings Institute, Washington, D.C.

June 15 - 16, 1976

R&D Budgets and Technological Advance, presented at the AAAS Colloquium on Research and Development in the Federal Budget, Washington, D.C. Proceedings of the Colloquium published by the American Association for the Advancement of Science, Washington, D.C., 1976.

Kalbs, Kas

September 27, 1975

Options for Cable Telecommunications Services in Connecticut, presented at conference on "Public Uses of Public Channels", Hartford, Connecticut, sponsored by the Institute of Public Service, University of Connecticut, and the Connecticut State Library.

December 9 - 11, 1975

Participated in seminar on "Communications and Society", Paris, France, sponsored by the International Broadcast Institute, Ecole Nationale Supérieure des Télécommunications, and the Haut Conseil sur l'Audiovisuel.

April 5 - 8, 1976

Telecommunications and Human Development: An Emerging Strategy, presented at World Environment Resources Council Conference, Brussels, Belgium. Proceedings of the Conference published by Pergamon Press, Oxford, England, 1976.

LeGates, John C.

June 15, 1976

Organizer and chairman of panel on "Forces on Technical Development: The Market, Finance, Regulation and the Past", 1976 International Conference on Communications, Philadelphia, Pennsylvania, sponsored by the Communication Society Conference Board and Philadelphia Section, Institute of Electrical and Electronics Engineers. Proceedings of Conference published by IEEE, New York, N.Y., 1976.

Meyer, John R. and J. A. Gomez-Ibanez.

November 1975

Measurement and Analysis of Productivity in Transportation Industries, National Bureau of Economic Research Income and Wealth Conference, Williamsburg, Virginia.

Oettinger, Anthony G.

September 9, 1975

Panelist and discussant in session entitled "Consumer Questions", in 1975 Payments System Policy Conference on "EFTS: The Emerging Reality", held in San Francisco, California. Proceedings of the Conference published by the American Bankers Association, Washington, D.C., 1975.

October 8, 1975

Participated in the Domestic Council Privacy Committee's Roundtable discussion on Privacy and Information Policy for Vice President Rockefeller, Washington, D.C.

October 24 - 26, 1975

Participated in the Federal Communications Bar Association's Eighth Annual Seminar on Broadcasting and Social Issues, held in Williamsburg, Virginia.

October 28, 1975

Panelist for the session on "Toward a National Policy in Information", 38th American Society for Information Science Annual Meeting held in Boston, Massachusetts.

November 13 - 14, 1975

Panelist and discussant in the session entitled "National and International Technical Information Today", in the National Technical Information Service's Management Conference, St. Michael's, Maryland.

November 19, 1975

Lasers, Computers and the First Amendment, presented as part of the Marshall Woods Lecture Series, Brown University, Providence, Rhode Island.

February 23, 1976

Panelist in session on "America: The First Information Society?", 1976 American Association for the Advancement of Science Annual Meeting, Boston, Massachusetts.

April 21 - 23, 1976

Participated in the Fourth Annual Telecommunications Policy Research Conference at Airlee, Virginia. Panelist in two sessions: "New Technology and Intermodal Competition: Policy Issues" and "Support of Communications Policy Research".

Prives, Daniel

October 16 - 17, 1975

The Emerging "Pattern" of EFTS Legislation, presented at EFTS and the Law Workshop given by Payment Systems, Inc., Los Angeles, California. Proceedings of the Workshop published in Payment Systems Research Program, *EFTS and the Law*, January 1976.

May 25, 1976

Be Prepared to Deal with Legal Issues, Payment Systems Symposium, '76, Chicago, Ill., Payment Systems, Inc., New York, N.Y.

Figure 7.
REACHING VARIED PUBLICS —
THROUGH PRESENTATIONS

Tuesday, May 25, 1976
4:00-4:20 p.m.

"Be Prepared to Deal with Legal Issues"

A presentation of a recent legal study of what is a branch?

Daniel Prives, Associate,
Program on Information
Technologies, Harvard
University, Cambridge,
Massachusetts



be prepared **efts-** payment
MAY 23-25, 1976 **systems**
symposium

psi
PAYMENT SYSTEMS, INC.
ESTABLISHED 1964



Proceedings
of the
1975
Payments
System
Policy
Conference



CONSUMER QUESTIONS

Remarks of
Dr. Anthony G. Oettinger
Director of Harvard Program
on Information Technologies
and Public Policy
Harvard University
Cambridge, Massachusetts

September 7, 1976

Read, William H.

June 17, 1976

Information Resources, presented at Arlie House meeting of U.S. Information Agency Officers, Arlie House, Virginia.

August 13, 1976

On Information Technologies: What's Socially Desirable; What's Politically Acceptable, presented in seminar on "Global Communications in an Electronic Era" at the VII World Public Relations Congress, Boston, Mass.

Wormley, Wallace P.

January 28, 1975

On the Usage of Psychological Techniques to Measure Investment Preference, presented at Organizational Behavior Faculty Seminar, Harvard Business School, Boston, Massachusetts.

April 30, 1975

Portfolio Theory Risk: A Psychophysical Analysis, presented at the School of Organization and Management, Yale University, New Haven, Connecticut.

November 7 - 8, 1975

Business Policy for the Consulting Firm, presented at the Technology and Economics Corporate Planning Session, South Lee, Massachusetts.

April 21, 1976

Local Distribution of Information, presented at the Management of Technology Research Workshop, Harvard Business School, Boston, Massachusetts.

July 12 - 13, 1976

Financial Implications of Regulation, panelist and discussant at the Federal Communications Commission Future Planning Conference on Alternatives and Improvements in Rate of Return Regulation, Washington, D.C. Proceedings of the Conference published by the Federal Communications Commission, Office of Plans and Policy, Washington, D.C., 1976.

Figure 7 (continued).

**REACHING VARIED PUBLICS —
THROUGH PRESENTATIONS**

Living with Technology


A Marshall Woods Lecture Series
organized by The Physical Sciences Council

1974
11 November, Milwaukee
12 December, Philadelphia
13 January, New York
14 February, Washington, D.C.
15 March, Washington, D.C.
16 April, Washington, D.C.
17 May, Washington, D.C.
18 June, Washington, D.C.
19 July, Washington, D.C.
20 August, Washington, D.C.
21 September, Washington, D.C.
22 October, Washington, D.C.
23 November, Washington, D.C.
24 December, Washington, D.C.

1975
11 January, Washington, D.C.
12 February, Washington, D.C.
13 March, Washington, D.C.
14 April, Washington, D.C.
15 May, Washington, D.C.
16 June, Washington, D.C.
17 July, Washington, D.C.
18 August, Washington, D.C.
19 September, Washington, D.C.
20 October, Washington, D.C.
21 November, Washington, D.C.
22 December, Washington, D.C.

1976
11 January, Washington, D.C.
12 February, Washington, D.C.
13 March, Washington, D.C.
14 April, Washington, D.C.
15 May, Washington, D.C.
16 June, Washington, D.C.
17 July, Washington, D.C.
18 August, Washington, D.C.
19 September, Washington, D.C.
20 October, Washington, D.C.
21 November, Washington, D.C.
22 December, Washington, D.C.

Brown
University
PHYSICAL SCIENCES COUNCIL



6

PUBLICATIONS 1975-76

This list of publications is in three parts. First, we list publications by Program research directors outside the Program. Then we list Program publications. The third part is an order form and price list for Program publications.

OUTSIDE PUBLICATIONS

- Berman, Paul J. "CATV Leased-Access Channels and the FCC: The Intractable Jurisdictional Question", *Notre Dame Lawyer*, Vol. 51, No. 2, December 1975, pp. 145 - 186.
- Kalba, Kas. "Electronic Media Coverage of the U.S. House of Representatives: A Preliminary Assessment of Technical Feasibility and Organizational Options" in *Television and Radio Coverage of the House*, Hearings before the Ad Hoc Subcommittee on Broadcasting, Committee on Rules, Ninety-fourth Congress, First Session, December 2 and 9, 1975, pp. 142 - 169 (Washington, D.C.: GPO, 1976).
- "Telecommunications in the Urban Sphere", *INTERMEDIA*, International Broadcast Institute, Vol. 4, No. 2, April 1976.
- Nye, Joseph S., Jr. "Independence and Interdependence," *Foreign Policy*, Spring 1976, no. 22, p. 130-161.
- Prives, Daniel. "Electronic Fund Transfer Systems and State Laws". *The Banking Law Journal*, Vol. 93, No. 5, May 1976, pp. 527 - 585.
- "The Explosion of State Laws on Electronic Fund Transfer Systems: Its Significance for Financial Institutions, Non-Financial Institutions and Consumers", *EFTS and the Law: Project 75-6*, Payment Systems Research Program, Payment Systems, Inc., New York, N.Y., January 1976, Chapter 4.
- Read, William H. "Global TV Flow: Another Look", *Journal of Communication*, Vol. 26, No. 3, Summer 1976, pp. 69 - 73.
- Wormley, Wallace P. "The Business of Satellites", in *Cablelines*, May/June 1975, pp. 8 - 9, 30.
- "The Computer Industry", in *Cablelines*, March 1975, pp. 9 - 10, 28.
- "Economic Outlook for 1975: The Cable Television Environment", in *Cablelines*, January 1975, pp. 18, 22.
- "Images of Women in Media Advertising", in *Cablelines*, November 1974, pp. 4 - 5.
- "Media Message Money: Economics of Media", in *Cablelines*, July/August 1975, pp. 7 - 11, 20.
- Portfolio Manager Preferences in an Investment Decision Making Situation: A Psychological Study*. Unpublished doctoral dissertation, Harvard University, 1976.

PROGRAM PUBLICATIONS

- Annual Report. Harvard University Program on Information Resources Policy.
Volume One: *Information Resources Policy: Arenas, Players and Stakes*. 36 pp. November 1976.
Volume Two: *Information Resources Policy: Program Projects*. 48 pp. November 1976.
- Sichter, James W. *Separations Procedures in the Telephone Industry: The Historical Origins of a Public Policy*. 148 pp. October 1976.
- Long-distance service is one of the most potent sources of telephone revenues. Since a long-distance call may involve more than one tele-

phone company and more than one regulatory agency, complicated intercompany settlements and jurisdictional separations have been devised under mandates to assure each provider of service with a fair share of the revenues and each user with a fair price for the service. The paper explains how these procedures were begun and how they operate today.

Wormley, Wallace P. *Information Logistics: Local Distribution of Information*. 89 pp. September 1976.

This paper treats the local newspaper as an information product in an unstable state because its traditional functions are being fulfilled by others and its markets are under challenge. Trends favorable to the local newspaper (and unfavorable trends) are examined. Technological developments that may affect the local distribution of information are surveyed.

Oettinger, Anthony G. *Performance, Politics and Policy in Computer/Communications: A Policy Agenda*. 13 pp. June 1976

Looking beyond polarized arguments over

competition vs. monopoly in the computer/communications arena, this paper notes the massive social and technological changes that have occurred since the enactment of the Communications Act of 1934. Given the importance of communications, the paper suggests that examining the validity of the Act of 1934 is the first order of public business.

Berman, Paul J. and Oettinger, Anthony G. *The Medium and the Telephone: The Politics of Information Resources*. 170 pp. June 1976.

Traces the politics, economics and technology of telecommunications pricing and costing policy using newspaper and television news as a concrete example for probing policy impacts. 49 charts and tables.

Borchardt, Kurt. *Towards a Theory of Legislative Compromise*. 50 pp. May 1976.

This paper deals with one aspect of the compromise-reaching process: generating alternatives to accommodate conflicting positions on legislative proposals.

Figure 8.
REACHING VARIED PUBLICS —
THROUGH CONGRESSIONAL TESTIMONY

TELEVISION AND RADIO COVERAGE OF THE HOUSE
HEARINGS
APPROX 1976
AD HOC SUBCOMMITTEE ON BROADCASTING
OF THE
COMMITTEE ON RULES
HOUSE OF REPRESENTATIVES
NINETY-FOURTH CONGRESS
DECEMBER 2 AND 9, 1975

ELECTRONIC MEDIA COVERAGE OF THE U.S. HOUSE OF REPRESENTATIVES: A PRELIMINARY ASSESSMENT OF TECHNICAL FEASIBILITY AND ORGANIZATIONAL OPTIONS

(Prepared by Rex Kahn with the assistance of Geoffrey White; sponsored by the Public Broadcasting Service)

Like other major American institutions, the House of Representatives has served increasing audiences in recent years by the utilization of electronic modes of communication in fulfilling its organizational purposes. It has studied the ways in which access to computerized information can speed the legislative decision-making process. It has adopted new modes of internal communication, ranging from the electronic one heard of the Chamber to a telephone reporting system on the status of legislative bills. And it has opened Committee hearings to a selective public, on the electronic news media, so that deliberations of the House could be more readily available to the American public.

Currently, the House is considering whether to extend access to the electronic media to floor proceedings as well as what other more specialized uses these media could serve. While it is not the first time that these questions are being debated—the first bill aimed at opening the Congress to the broadcast media was introduced in 1964—the issues they raise are being treated in more detail and with a greater sense of urgency than in previous years. These issues, it should be noted, fall into two general categories:

- (1) whether coverage of the Chamber should be allowed, and if so, what the impact will be on the House and the Members, on its relationship with the executive branch, and on the American public; and
- (2) how coverage could be provided in a practical manner that would minimize and not undermine the institutional continuity and legislative functions of the House.

The focus of the following report is on this second category of concerns. In

costing and pricing issues from several murky broths. It draws partly on the pristine definitions in the financial accounting literature but mainly on actual usage by interested parties.

Mosco, Vincent. *Reforming Regulation: The FCC and Innovations in the Broadcasting Market*. 52 pp. February 1976

This report evaluates the many reform proposals marking the forty year history of the FCC — and also suggests others — based on an alternative to traditional approaches to the study of organizations. NTIS, #PB 252315/AS

Prives, Daniel. *The Explosion of State Laws on Electronic Fund Transfer Systems: Its Significance for Financial Institutions, Non-Financial Institutions, and Consumers*. 76 pp. Jan. 1976

This is a study of twenty-two state laws dealing with Electronic Fund Transfer (EFT) systems to illuminate the effect such laws might have on banking institutions, non-banking institutions involved in EFT systems, and on consumers. NTIS, #PB-249972/AS.

Clippinger, John H. *Who Gains by Communications Development? Studies of Information Technologies in Developing Countries*. 124 pp. January 1976

Much attention has been given to potential benefits of services based upon communication technology for accelerating Third World development but relatively little attention has been paid to how these benefits are distributed or realized in practice.

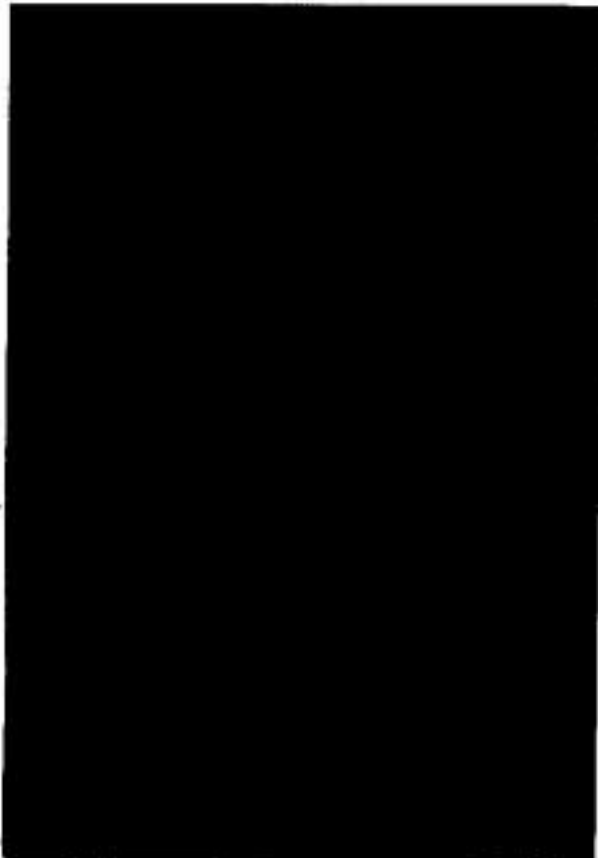
Oettinger, Anthony G. *Elements of Information Resources Policy: Library and Other Information Services*. 223 pp. Jan. 1976

Examines the relationships among information providers and their clients. The economic, institutional, and technological factors which determine how people get the information they need are addressed. 78 charts and tables. (Report to the National Commission on Libraries and Information Science.) NTIS,

#PB-248675/AS.

Figure 9 (continued).

**REACHING VARIED PUBLICS —
THROUGH DIVERSE PUBLICATIONS**



Seipp, David J. *Privacy and Disclosure Regulation of Information Systems: A Bibliographic Survey*. 107 pp. November 1975

Surveys the literature on present and proposed legislation about both privacy protection and freedom of information. NTIS, #PB-248309/AS.

Kalba, Kas. *City Meets the Cable: A Case Study in Technological Innovation and Community Decision-Making*. 291 pp. \$23.40 Sept. 1975.

A case study on the cable TV decision process in Cincinnati. Compares the results with decision-making in other large cities and evaluates several prescriptive approaches to cable development ("deregulation", franchising guidebooks, and public planning proposals) in the light of how decisions are actually made at the municipal level.

Mosco, Vincent. *The Regulation of Broadcasting in the United States: A Comparative Analysis*. 308 pp. August 1975

A report on FCC decision-making on four innovations in the Broadcasting market (FM,

UHF, CATV, STV). The FCC treated each innovation as ancillary to the dominant commercial broadcasting system.

Berner, Richard. *Constraints on the Regulatory Process: A Case Study of Regulation of Cable Television*. 143 pp. Aug. 1975.

Describes the forces that shape the FCC's cable regulatory process.

Berman, Paul J. *CATV Leased Access Channels and The Federal Communications Commission: The Intractable Jurisdictional Question*. 77 pp. June 1975

This paper traces the history of FCC jurisdiction over CATV developing the hypothesis that the jurisdictional question is as elusive today as it was fifteen years ago.

Oettinger, Anthony G. and Shapiro, Peter D. *Information Industries in the United States*. 10 pp. May 1975

Describes the "information explosion" and the concomitant growth of communications systems leading to the formation of new kinds of industries.

Figure 10.
**REACHING VARIED PUBLICS —
THROUGH PROGRAM PUBLICATIONS**

Mass Media Booknotes

July 1975, #11 (no. 68)
©1975 by Christopher H. Sterling, Department of Radio-TV-Film
Temple University, Philadelphia, Pennsylvania 19122

Book of the Month

We hinted briefly last month at an exciting new research program (see #10:118) which readers of *MMB* should be aware of. Practicing what we preach, here is a fuller-length discussion of some of media-related publications of the Program on Information Technologies and Public Policy, Harvard University, 200 Aiken Computation Laboratory, Cambridge, Ma. 02138. Here are the major reports now available at the costs indicated:

A Perspective on Information Resources: Scope of the Program 1973-74 (printed, 11 pp.) is the best place to start an understanding of what the program is doing and has accomplished. This short booklet includes many valuable tables on information communication in the U.S.

Bibliographic Tools: Volume 1, edited by Carol Weisheit (typescript, 50 pp.); and **Bibliographic Tools: Volume 2, Legislative Guide**, edited by Carol Weisheit (typescript, 108 pp.) is the third revision of a basic working paper of the project. It began as a supplement listing for a Harvard course, and has now grown to a reference of value to all. Volume 1 includes a guide (annotated) to basic references on information technology, an annotated bibliography of books and reports on the subject area, a short title-author listing of articles held in the program's files (such as "How Slime Molds Communicate" and other goodies), and audiotapes and videotapes developed by the program. Volume 2 is longer and of more general value, including sections on federal legislation, presidential documents, a guide to federal agencies and departments, and a reprint of two useful articles: Krassner's "Inside the FCC: A Guide for Information Seekers", and LaDuc's "Broadcast Legal Documentation: A Four-Dimen-

sional Guide". With the exception of the last two reprints, the second volume is organized along self-programming lines helping even a "green" researcher find what he needs. This is invaluable and would make a fine course supplement.

Toward a Quantification of the Information/Communication Industries, by Warren G. Lavey (typescript, 114 pp.) is one of the most useful publications of the lot in that it gathers a great variety of statistical descriptive material on media and information communication. Coverage includes broadcasting, telephones, domestic telegraphs, postal service, newspapers, book publishing, motion pictures, cable television, periodicals and computer services. Detailed notes on sources.

TELECOMMUNICATIONS REPORTS

WEEKLY NEWS SERVICE COVERING THE TELEPHONE, TELE-
GRAPH AND RADIO COMMUNICATIONS FIELDS SINCE 1934

VOLUME FORTY-TWO, NO. 25

July 15, 1974

A working paper by Anthony G. Oettinger, entitled "Performance, politics, and policy in computer/communications: a policy agenda," has been issued. The document examines "needs and means: myths and realities." Dr. Oettinger is Director of Harvard University's Program on Information Technologies & Public Policy, and the booklet is available at \$10.00 a copy from the organization, at 200 Aiken Computation Laboratory, Cambridge, Mass. 02138. . .

Branscomb, Anne W. *The Cable Fable: Will It Come True?* 15 pp. April 1975

Science fiction claims and "blue sky" promises oversold an industry and tied it up in red tape. A realistic assessment finds its future a matter of public concern.

Weinhaus, Carol, editor. *Bibliographic Tools*. updated February 1976.

Volume One: a guide to reference books, monographs, journals and other literature. 79 pp.

Volume Two: Legislative Guide - guide to legislation, executive orders, regulatory decisions, etc. 109 pp.

DiMaggio, Paul and Zapol, Nikki. *Information Technologies and Control Over Learning*. 52 pp. April 1975

Outline of project for analyzing the patterns of control over information flow to learners via traditional textbooks, broadcast video and computer assisted instruction.

Phister, Montgomery, Jr. *The Economics of Technology*. 22 pp. January 1975

Discusses importance of the production, distribution and consumption of high-technology goods and services, and how these might be better examined at universities.

Phister, Montgomery, Jr. *Shared Systems versus Stand-Alone Systems*. 24 pp. January 1975

Examines the functional and cost performance of shared versus stand-alone computer systems.

Oettinger, Anthony G., and Shapiro, Peter D. *A Dialogue on Technology Assessment: The Video Telephone Critique and Rejoinder*. 15 pp. January 1975

A critical review of facts, assumptions and speculations found in Dickson and Bowers' assessment of the video telephone.

Oettinger, Anthony G. *Merging Media and The First Amendment*. 6 pp. Winter 1975

The transcript of an address to the Nieman Assembly, a gathering of newspaper and television executives convened by the Nieman Foundation at Harvard University.

Berman, Paul J. *Computer or Communications? Allocation of Functions and the Role of the Federal Communications Commission*. 91 pp. Fall 1974

Interaction between new offerings combining computer and communication technologies and old legal doctrines leads to evaluation of the scope of the concept of communications common carriage with resulting impact on the jurisdiction of FCC and policy options available to deal with these new offerings. NTIS, #PB-235146/AS.

Shapiro, Peter D. *Public Policy as a Determinant of Market Structure: The Case of the Specialized Communications Market*. 184 pp. September 1974

How public policy actions interact with other factors in the structuring of the specialized communications market.

Lavey, Warren G. *Transportation/Communication Considerations in the Location of Headquarters for Multi-Establishment Manufacturing Firms*. 45 pp. August 1974

An examination of the importance of transportation/communications considerations on the location of corporate headquarters.

Lavey, Warren G. *Toward a Quantification of the Information/Communication Industries*. 120 pp. May 1974

A rough census of the information industries; preliminary attempts at comparison are made. NTIS, # PB-232548.

Oettinger, Anthony G., and Zapol, Nikki. *Will Information Technologies Help Learning?* 26 pp. September 1972

The paper analyzes the scientific, technological and economic limitations on the effectiveness of information technologies, and describes the impact on this effectiveness of policy issues in areas outside the "ed biz" — broadcasting, libraries, postal services, publishers and others.

Hayes, Robert H. *Europe's Computer Industry: Closer to the Brink*.

An essay on the competitive status of the European computer industry and its options for the future.

ORDER LIST FOR PROGRAM PUBLICATIONS

	Copies	Amount
Annual Report 1975-76. Harvard University Program on Information Resources Policy. Volume One: <i>Information Resources Policy: Arenas, Players and Stakes.</i> Volume Two: <i>Information Resources Policy: Program Projects.</i> (Copies of the first three Program annual reports available on request as long as supplies last.)	\$23.40	_____
Sichter, James W. <i>Separations Procedures in the Telephone Industry: The Historical Origins of a Public Policy.</i>	\$10.90	_____
Wormley, Wallace P. <i>Information Logistics: Local Distribution of Information.</i>	\$10.90	_____
Oettinger, Anthony G. <i>Performance, Politics and Policy in Computer Communications: A Policy Agenda.</i>	\$10.90	_____
Berman, Paul J. and Oettinger, Anthony G. <i>The Medium and the Telephone: The Politics of Information Resources.</i>	\$23.40	_____
Borchardt, Kurt. <i>Towards a Theory of Legislative Compromise.</i>	\$23.40	_____
Argyris, Chris. <i>Organizational Learning and Effective Management Information Systems: A Prospectus for Research.</i>	\$10.90	_____
Prives, Daniel. <i>E.F.T. Systems Under Branching and Banking Business Regulations.</i>	\$10.90	_____
Imrie, Gordon. <i>The U.S. Mail Network: Who Pays, Who Plays.</i>	\$10.90	_____
Capron, William M. <i>Comments on Telecommunications Policy Developments.</i>	\$10.90	_____
Read, William H. <i>Foreign Policy: The High and Low Politics of Telecommunications.</i>	\$23.40	_____
Karlin, Arlene. <i>Glossary of Costing and Ratemaking Terms in the U.S. Postal Service and the American Telephone & Telegraph Company.</i>	\$10.90	_____
Mosco, Vincent. <i>Reforming Regulation: The FCC and Innovations in the Broadcasting Market.</i>	\$23.40	_____
Prives, Daniel. <i>The Explosion of State Laws on Electronic Fund Transfer Systems: Its Significance for Financial Institutions, Non-Financial Institutions, and Consumers.</i>	\$23.40	_____
Clippinger, John H. <i>Who Gains by Communications Development? Studies of Information Technologies in Developing Countries.</i>	\$10.90	_____
Oettinger, Anthony G. <i>Elements of Information Resources Policy: Library and Other Information Services.</i>	\$23.40	_____
Seipp, David J. <i>Privacy and Disclosure Regulation of Information Systems: A Bibliographic Survey.</i>	\$23.40	_____
Kalba, Kas. <i>City Meets the Cable: A Case Study in Technological Innovation and Community Decision-Making.</i>	\$23.40	_____
Mosco, Vincent. <i>The Regulation of Broadcasting in the United States: A Comparative Analysis.</i>	\$23.40	_____
Berner, Richard. <i>Constraints on the Regulatory Process: A Case Study of Regulation of Cable Television.</i>	\$23.40	_____

Berman, Paul J. <i>CATV Leased Access Channels and the Federal Communications Commission: The Intractable Jurisdictional Question.</i>	\$10.90	_____
Oettinger, Anthony G. and Shapiro, Peter D. <i>Information Industries in the United States.</i>	\$23.40	_____
Branscomb, Anne W. <i>The Cable Fable: Will It Come True?</i>	\$23.40	_____
Weinhaus, Carol, editor. <i>Bibliographic Tools.</i>		
Volume One: Guide to reference books, monographs, journals and other literature.	\$10.90	_____
Volume Two: Legislative guide.	\$10.90	_____
DiMaggio, Paul and Zapol, Nikki. <i>Information Technologies and Control Over Learning.</i>	\$10.90	_____
Phister, Montgomery, Jr. <i>The Economics of Technology.</i>	\$23.40	_____
Phister, Montgomery, Jr. <i>Shared Systems versus Stand-Alone Systems.</i>	\$10.90	_____
Oettinger, Anthony G. and Shapiro, Peter D. <i>A Dialogue on Technology Assessment: The Video Telephone - Critique and Rejoinder.</i>	\$23.40	_____
Oettinger, Anthony G. <i>Merging Media and The First Amendment.</i>	\$23.40	_____
Berman, Paul J. <i>Computer or Communications? Allocation of Functions and the Role of the Federal Communications Commission.</i>	\$23.40	_____
Shapiro, Peter D. <i>Public Policy as a Determinant of Market Structure: The Case of the Specialized Communications Market.</i>	\$10.90	_____
Lavey, Warren G. <i>Transportation/Communication Considerations in the Location of Headquarters for Multi-Establishment Manufacturing Firms.</i>	\$10.90	_____
Lavey, Warren G. <i>Toward a Quantification of the Information/Communication Industries.</i>	\$23.40	_____
Oettinger, Anthony G. and Zapol, Nikki. <i>Will Information Technologies Help Learning?</i>	\$23.40	_____
Hayes, Robert H. <i>Europe's Computer Industry: Closer to the Brink.</i> A copy of this paper may be obtained from the <i>Columbia Journal of World Business</i> , 408 Uris Hall, Columbia University, New York, N.Y., 10027. vol. 9, no. 2, Summer 1974. \$1.50.		

In addition, notes were taken at the Faculty Seminars, and tape recordings were made of most of them. These are too informal to merit inclusion on any list of Program products. However, if any of the seminars are of special interest, we will deliver available notes (at no charge) or tapes for the cost of reproduction (\$4.00).

To order, send letter or purchase order or telephone:
 Program on Information Resources Policy
 200 Aiken Computation Laboratory
 Harvard University
 Cambridge, Massachusetts 02138
 617 495-3986

A 10% discount will apply to any prepaid order, or we can bill you. An additional discount of 10% will apply to academic institutions.

The Program deeply appreciates the time and thought these people gave to reviewing our projects and publications. Reviewing is an essential part of the process of research and dissemination. Reviewers are asked to press their views as strongly as they wish, but final responsibility rests with the project directors and the Program.

James Alleman
Elizabeth Allison
Robert Angliss
Robert Anthony
Hal Arnold
Verne Atwater
Allan Axelrod
Harold Baer
Morton Baratz
Daniel Bell
James Bell
Robert Bennis
Philip Blumberg
Hendrik Bode
Kurt Borchardt
Stephen Breyer
Harvey Brooks
Keith Brown
Russell Browne
Joe Burke
Frank Burrows
William Capron
James Chandler
John Clippinger
Vern Countryman
Edwin Cox

Gerald Cullinan
Emilio Daddario
Larry Darby
James Darr
Paul Daubitz
Edward Day
John Dean
Robert Dickinson
Wilson Dizard
Hugh Dougherty
Martin Ernst
Richard Etzi
Ned Farinholt
Stuart Feldstein
Russell Fenwick
William Fishman
Edward Fitzgerald
Jean Foster
Richard Francis
Richard Freund
Richard Gabel
Wreatham Gathright
Henry Geller
John Gentile
Joe Gibson
Richard Gifford
Dean Gillette
Daniel Goldenberg
Hyman Goldin
James Greaney
Douglas Green
John Griffith
Fred Hartley
Dale Hatfield
Chris Heller
Regina Herzlinger
Winston Himsworth
Donald Hollis
Roland Homet
Thomas Horton
Coleman Hoyt
Gordon Imrie

Donald Isaacs
David Johnson
Harold Johnson
Bruce Jolley
Charles Joyce
Andrew Kaufman
Carl Keil
John Keneally
John Kimball
Mel Klein
Erwin Krasnow
Arvid Larson
Harvey Levin
Michael Levine
Nathan Lindabury
Elmer Lower
John Lydick
Preston Mabon
Lewis Mandel
Robert Marbut
Gene Mater
William McGowan
James McLaughlin
Gail Melick
William Moore
Vincent Mosco
Gideon-Cyrus Mutiso
Robert Myers
Delbert Myren
Roy Nierenberg
Joseph Nye
Daniel Parker
Tom Parmenter
James Peacock
Donald Peterson
Almarin Phillips
Gerard Piel
Edward Pioman
Ithiel de Sola Pool
Robert Prim
Daniel Prives
James Rademacher

Gordon Raisbeck
William Read
Harold Redding
John Richardson
Eugene Rostow
John Rothman
Peter Salisbury
Charles Sanders
Frank Saponaro
Josef Schengili
Blair Schick
Hal Scott
David Seipp
Peter Shapiro
George Shawy
James Sichter
Ted Simis
Theda Skocpol
Michael Spence
Richard Stewart
Donald Stitzenberg
Bernard Strassburg
Majid Tehrarian
Anthony Terracciano
Jules Tewlow
Donald Thurston
Arthur Traub
Chris Vizas
Gordon Walter
Fred Warden
George Waters
Steven Weiss
James Wells
Alan Westin
George White
Earle Whitney
Nancy Wiatt
Bruce Williams
Gordon Worley
Wallace Wormley
Linda Zimmer
Martin Zuckerman

DIRECTOR

Anthony G. Oettinger, director of the Harvard Program on Information Resources Policy, is Gordon McKay Professor of Applied Mathematics, Professor of Information Resources Policy and a member of the Faculty of Public Administration at Harvard University.

He is chairman of the CATV Commission of the Commonwealth of Massachusetts and a consultant to the National Security Council, Executive Office of the President of the United States. He is a member of the Research Advisory Board of the Committee for Economic Development and was an advisor to the CED subcommittee that prepared the report *Broadcasting and Cable Television: Policies for Diversity and Change*, issued by CED in April 1975. Since 1956, he has served as a consultant to Arthur D. Little, Inc., on the uses of information technologies in many industries; he served as a principal consultant to the team that prepared *The Consequences of Electronic Funds Transfer - A Technology Assessment of Movement Toward a Less Cash/Less Check Society*, a report for the National Science Foundation published by the Government Printing Office in June 1975.

He has been president of the Association for Computing Machinery (1966-68) and a consultant to the Office of Science and Technology, Executive Office of the President of the United States (1961-73). He is a Fellow of the American Academy of Arts and Sciences, the American Association for the Advancement of Science and the Institute of Electrical and Electronics Engineers.

As chairman of the Computer Science and Engineering Board of the National Academy of Sciences (1967-73), he led the preparation of NAS reports on *A Technical Analysis of the Common Carrier/User Interconnections Area* (Lewis S. Billig, Project Director), *Databanks in a Free Society: Computers, Record Keeping and Privacy* (Alan F. Westin, Project Director) and on *Libraries and Information Technology - A National System Challenge* (Ronald L. Wigington, Project Director). He is the author of *Automatic Language Translation: Lexical and Technical Aspects*, of *Run, Computer, Run: The Mythology of Educational Innovation* and of numerous papers on the uses of information technologies, including, most recently, *Foreign Policy Choices for the 1970s and 1980s: Information Resources: Strategic Strengths -- Strategic Weaknesses*, a report of the Program prepared, with William Read, at the request of the U.S. Senate Foreign Relations Committee.

EXECUTIVE DIRECTOR

John C. LeGates is Executive Director of the Program and Lecturer in Information Resources Policy. His experience prior to joining the Program has been in the development of educational and medical applications of computing.

At EDUCOM, he was the executive director of the Educational Information Network (EIN) and the author of several articles on computer networking. Earlier, as Vice President of Cambridge Information Systems, Inc., he was director of the technical staff, and responsible for the company's nationwide marketing efforts. He also directed the development of the Massachusetts General Hospital Integrated Information System.

At Computer Advisory Services to Education, Inc., he was vice president and director. At Bolt, Beranek and Newman, Inc., he was responsible for exploring the potential of the TELCOMP language in education.

His studies were in mathematics (Harvard) and philosophy (Yale).

POLICY COMMITTEE 1975-1976

Harvey Brooks

Faculty of Arts and Sciences

Benjamin Peirce Professor of Technology and Public Policy

William M. Capron

J.F. Kennedy School of Government

Lecturer on Political Economy and Associate Dean

Lawrence E. Fouraker

School of Business Administration

Professor of Administration and Dean

Howard H. Hiatt

School of Public Health

Professor of Medicine and Dean

John C. LeGates

Executive Director, Program on Information Resources Policy

Lecturer in Information Resources Policy

Aimee D. Leifer

School of Education

Associate Professor of Education

Lawrence D. Mann

School of Design

Professor of City and Regional Planning

Anthony G. Oettinger

Director of Program on Information
Resources Policy
Professor of Applied Mathematics and of
Information Resources Policy

Albert M. Sacks

Law School
Dane Professor of Law and Dean

EXECUTIVE COMMITTEE 1975-1976

Chris Argyris

Schools of Education and Business
Administration
Professor of Education and Organizational
Behavior

Harvey Brooks

Faculty of Arts and Sciences
Benjamin Peirce Professor of Technology and Pub-
lic Policy

William M. Capron

J.F. Kennedy School of Government
Senior Lecturer on Political Economy and
Associate Dean

Robert H. Hayes

School of Business Administration
Professor of Business Administration

John C. LeGates

Executive Director, Program on Information
Resources Policy
Lecturer in Information Resources Policy

John R. Meyer

School of Business Administration
1907 Professor in Transportation, Logistics
and Distribution

Arthur R. Miller

Law School
Professor of Law

Joseph S. Nye

Faculty of Public Administration
Professor of Government

Anthony G. Oettinger

Director of Program on Information
Resources Policy
Professor of Applied Mathematics and of
Information Resources Policy

CORE PROGRAM STAFF

Anthony G. Oettinger

Director

John C. LeGates

Executive Director

Claire M. Bishop

Administrative Assistant

Sylvia Cashton

Secretary

Margaret Helfrick

Secretary

Carol L. Weinhaus

Research Assistant and Librarian

David Seipp

Recorder

Larry Beyer

Research Assistant

RESEARCH FELLOWS

Kurt Borchardt

John H. Clippinger

Vincent Mosco

William H. Read

Peter D. Shapiro

Richard J. Solomon

Alan F. Westin

Wallace P. Wormley

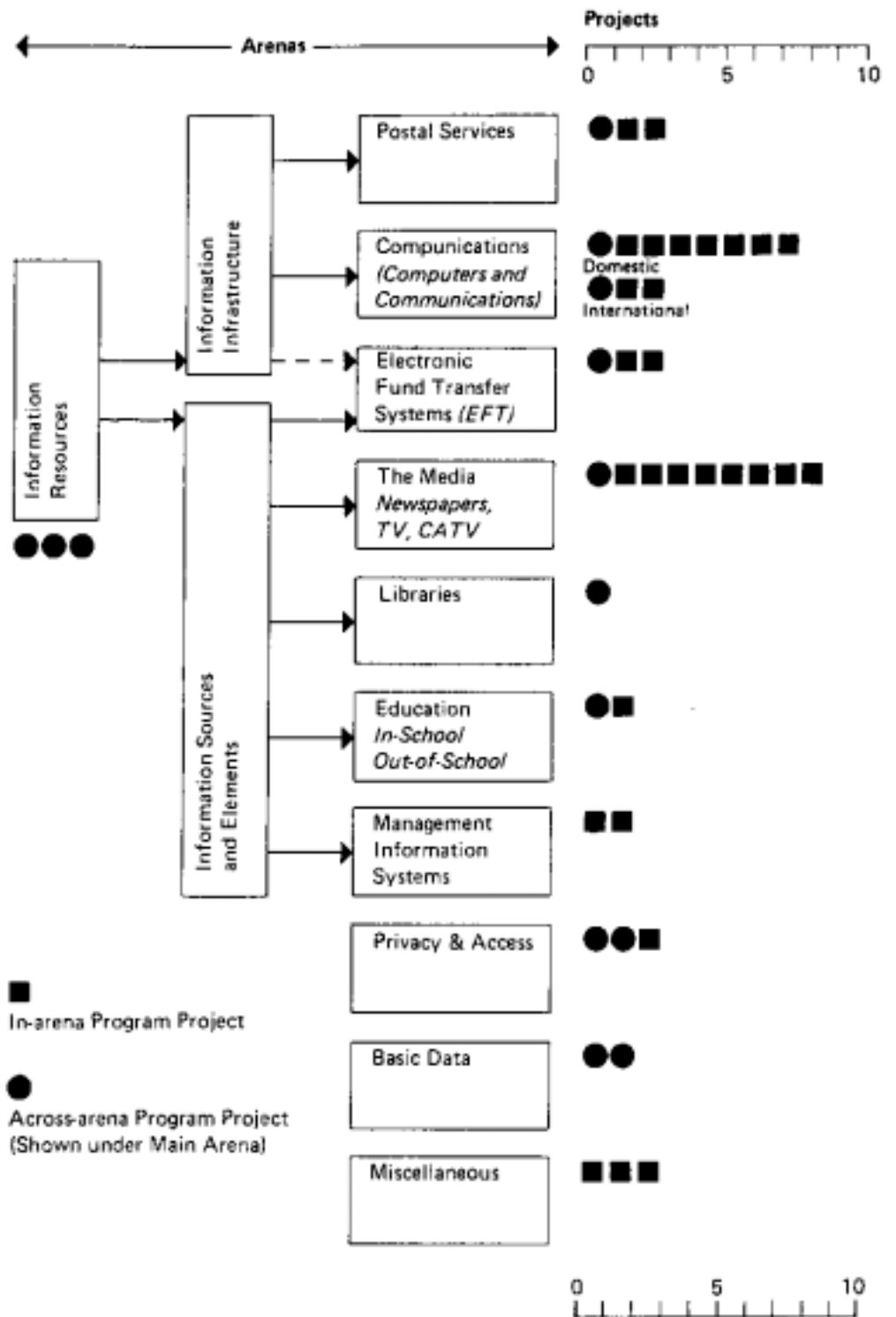
CONSULTING EDITORS

Milton R. Benjamin

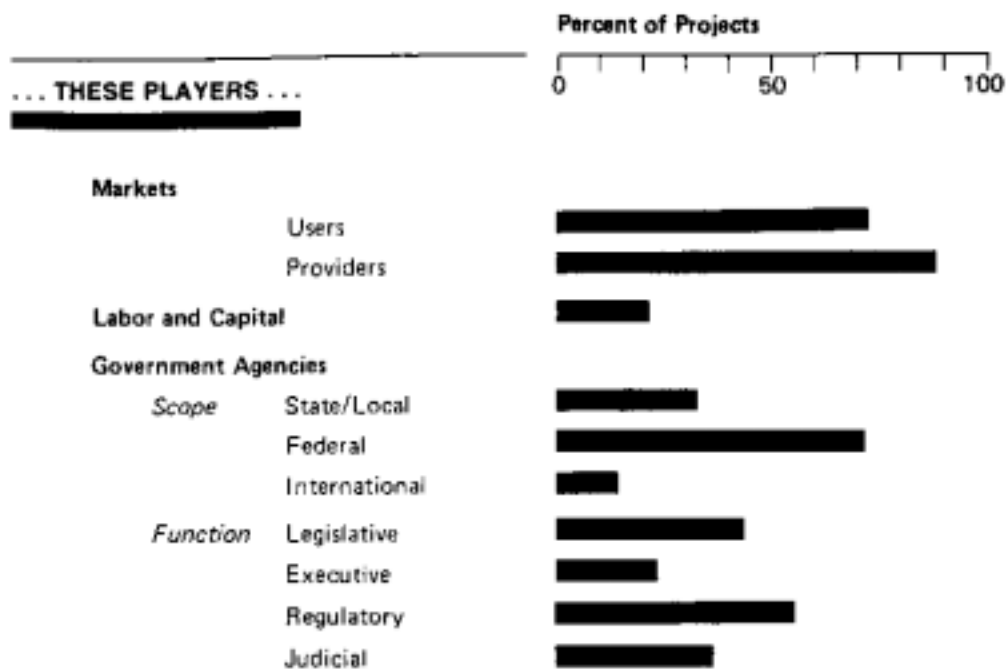
Tom Parmenter

**Design: Designs & Devices, Inc.
Cambridge, Massachusetts**

THE PROGRAM HAS CONDUCTED STUDIES IN THESE ARENAS:



THESE STUDIES DEAL WITH . . .



... AND THESE STAKES ...



... USING THESE TOOLS.

