

***Information
Resources
Policy***

*Program
Projects*

2

*Annual Report 1976-1977
Volume Two*

*Program on Information
Resources Policy*



Harvard University

CONTENTS

1 Introduction	2	5 Presentations of Research Results 1976-77	38
2 Program Research 1976-77	4	6 Publications 1976-77	41
3 Teaching 1976-77	34	7 Reviewers 1976-77	51
4 Faculty Seminars 1976-77	36	8 The Program Staff	54

AFFILIATES

American Can Company
 American District Telegraph Company
 American Telephone and Telegraph
 Arthur D. Little Foundation
 Bell Canada
 Booth Newspapers
 The Boston Globe
 Ccdex Corporation
 Communications Workers of America
 Computer and Communications Industry Association
 Data Transmission Company
 Donaldson, Lufkin & Jenrette
 Executive Office of the President
 Office of Telecommunications Policy
 L.M. Ericsson (Sweden)
 Federal Communications Commission
 Federal Reserve Bank of Boston
 First National Bank of Boston
 First National Bank of Chicago
 General Electric Company
 General Telephone & Electronics
 Harper & Row
 Harte-Hanks Communications, Inc.
 Honeywell, Inc.
 IBM Corporation
 International Data Corporation
 International Paper Company
 International Resources Development, Inc.
 Interpublic Group of Companies, Inc.
 Iria Communications & Development Institute
 Lev Enterprises
 Litton Industries
 Lockheed Missiles and Space Company
 John & Mary R. Markie Foundation
 McGraw-Hill, Inc.
 Mead Corporation
 Minneapolis Star and Tribune Company
 New York Times Company
 Nippon Electric Company
 Norfolk & Western Railway Company
 Payment Systems, Inc.
 Pitney Bowes, Inc.
 Polaroid Foundation, Inc.
 PFC Information Sciences Company
 RCA Global Communications
 Reuters, Ltd.
 Rockefeller Brothers Fund
 Rockwell International
 Salmon Brothers
 Selden & De Cuevas, Inc.
 Southern Pacific Communications
 Stromberg-Carlson Corporation
 Systems Applications, Inc.

Time Incorporated
 Transamerica Corporation
 United Telecommunications
 U.S. Department of Commerce:
 National Technical Information Services
 Office of Telecommunications
 United States Postal Service
 Western Union Corporation
 Western Union International, Inc.
 Xerox Corporation

SPECIAL PROJECTS

National Association of Broadcasters
 National Commission on Libraries and Information Science
 National Science Foundation
 I. P. Sharpe Associates
 United States Congress:
 Office of Technology Assessment
 Senate Committee on Foreign Relations

STUDENT ASSISTANTSHIPS

American Express Company
 Bank of America
 Chase Manhattan Bank
 William Bingham Foundation

INFORMATION RESOURCES POLICY: PROGRAM PROJECTS ANNUAL REPORT 1976-77 VOLUME 2

Available on request is Volume 1 of the annual report for 1976-77, *Information Resources Policy: Arenas, Players and Stakes*.

PROGRAM ON INFORMATION RESOURCES POLICY

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

In its five years of work, the Program on Information Resources Policy has conducted some sixty projects on 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 and across them.

Typically, an arena has comprised a project or series of projects aimed at these fundamental descriptions of the subject matter. In the past year, however, we have begun to expand to meet growing needs for in-depth research in four arenas of the first priority. These are Postal Services, Communications (computers - and - communications), Electronic Funds Transfer Systems, and the Media (broadcasting, publishing, movies and cable TV). The full expansion plan is available as a Program working paper, *Prospectus for the Expansion of the Program* by John C. LeGates and Anthony G. Oettinger. Under this plan, John F. McLaughlin, formerly director of strategic planning for the Postal Service, has joined the program as Executive Director of the Postal Arena. For the Media Arena, the Program sponsored a week-long Executive Perspective Building Forum which launched new activities in research on the media.

In the pages that follow, each arena that the Program has examined is described and each major research project summarized.

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

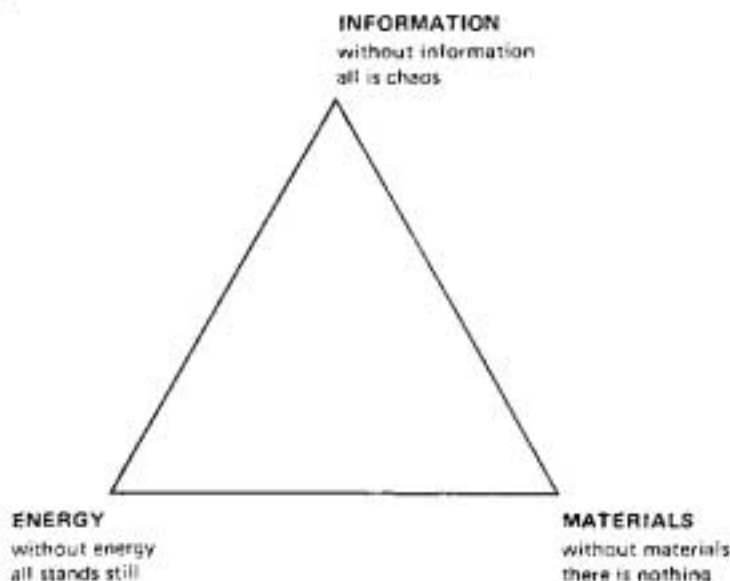


Figure 2.

THE INFORMATION INDUSTRIES

	Approximate Gross Revenue (in billions of dollars)						
	1970	1971	1972	1973	1974	1975	1976
Broadcast television	2.8	2.8	3.2	3.5	3.8	4.1	NA
Cable television	0.3	0.3	0.4	0.5	0.6	0.7	0.9*
Broadcast radio	1.1	1.3	1.4	1.5	1.6	1.7	NA
Telephone	18.2	20.0	22.6	25.5	28.3	31.3	35.6
Telegraph	0.4	0.4	0.4	0.5	0.5	0.5	0.5
Specialized common carriers	0.0	0.0	0.0	0.0	0.0	0.0	0.1*
Satellite carriers	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Mobile radio systems	2.0	2.2	2.4	2.6	2.9	3.2	NA
Motion pictures	3.8	3.8	2.9	3.8	5.5	NA	NA
Organized sports, theaters, etc.	4.4	NA	NA	NA	NA	NA	NA
Computer software suppliers	1.5	1.7	2.0	2.5	3.0	3.6	4.3
Computer service suppliers							
Postal service	6.3	6.7	7.9	8.3	9.0	10.0	11.2
Private information delivery services	0.7+	0.8+	1.0+	1.2+	1.3+	1.6+	1.7+
Newspapers, wire services	7.0	7.4	8.3	8.9	9.6	10.0*	11.2*
Periodicals (including newsletters)	3.2	3.2	3.5	3.9	4.1	4.2*	4.6*
Business consulting services	0.9	1.1	1.1	1.5	1.7	NA	NA
Advertising	7.9	7.6	8.0	8.6	9.7	NA	NA
Marketing and sales	32.4	37.7	41.3	43.4	47.0	50.6	NA
Brokerage industries	40.6	47.4	55.3	61.0	64.0	NA	NA
Book publishing and printing	3.4	3.6	3.8	4.2	4.5	4.8*	5.1*
Libraries	2.1	NA	3.6	NA	NA	NA	NA
Schooling	70.1	76.4	82.9	89.4	98.1	107.3	119.8*
Research and development	25.9	26.6	28.3	30.3	32.3	34.6*	37.4*
Federal information institutions							
Census Bureau	0.1	0.1	0.1	0.1	0.1	0.1	0.1
National intelligence community	4.0+*	NA	NA	NA	7.0*	10.0+**	6.0+**
National Technical Information Service	0.0	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	2.6
County agents, government	0.3	0.3	0.4	0.4	0.4	0.4	0.5
Banking and credit	61.1	68.9	77.6	101.3	136.2	NA	NA
Insurance	92.6	103.5	113.8	123.6	133.1	NA	NA
Legal services	8.5	9.6	10.5	12.2	13.7	NA	NA
U. S. Gross National Product	982.4	1,063.4	1,171.1	1,306.6	1,413.2	1,516.3	1,691.6

*estimated

**official government figures computed by different methods for each year.

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.

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."

The report leaves as an issue with the Committee: With America moving into what sociologist Daniel Bell calls an "information age", can the nation afford to be as complacent about information re-

sources as it once was about food, money, and energy?

The report was prepared by **William H. Read**, Research Fellow on detail from the White House Office of Telecommunications Policy, with **John LeGates**, **Anthony Oettinger** and **Carol Weinhaus** of the Program staff. It is available as a Program publication, *Foreign Policy Choices for the 1970's and 1980's: Information Resources—Strategic Strengths—Strategic Weaknesses*. In June 1977, Oettinger and LeGates testified before the Foreign Relations Subcommittee on International Operations, chaired by Sen. George McGovern.

BRITANNICA YEARBOOK REPORT

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 Prod-

uct. 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.

CHECKBOARD PATTERNS IN THE INFORMATION INDUSTRIES

The intertwined roles of different firms in the information industries are graphically presented in a Program working paper, *Information Industries: Patterns of Activities, Regulation and Sales*.

The paper consists of four charts showing the involvement of some forty firms in different markets of communications and computers, broadcasting, publishing, and other information-related services and products. The different charts concentrate on specific activities, rank by size and sales, and illustrate regulation by the FCC.

The charts are still tentative and incomplete, and the Program solicits the attention of its reviewers to this project. In final form the project report will be a reference source for all Program researchers.

The project is directed by **Carol Weinhaus**, of the Program's staff. She has been assisted by **Lawrence Beyer**, an undergraduate of Harvard College, and **Irwin Hipsman**, a work-study student from Antioch College.

PROGRESS AND POLICY

For policymakers, one of the great challenges of the new era of communications is the speed with which changes keep occurring. A consequence of the continued high rate of change is that the quality of our lives is affected well before social and economic impacts are understood and before sensible public policies can be formed. It is time to ask, by what rules will we live in this new era? Who will make the rules? And, most important, what will be the agenda that rulemakers will address?

In a Program working paper, *Communications Policy: An Agenda*, William Read identifies and

comments briefly on a set of issues which comprises a national communications policy agenda for the United States.

Read argues that the present policy process is inadequate, as shown in his discussion of several agenda items, including international telecommunications, national security, and the more traditional issues of antitrust policy and industrial competition. He concludes, "The overall record suggests that the issue of how the federal government should organize itself to make effective communications policy remains unresolved."

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. Nowhere 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.
- 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.

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.

In February 1977 Westin presented a portion of his study covering historical and theoretical aspects of privacy and information to the Program's Executive Perspective Building Forum under the title, "Organizational Decisions about People." Another section, on how automation has affected freedom of information practices in federal agencies will be published in the series *Advances in Computers*, Vol. 17.

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 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*.

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.

In 1970, Congress reorganized the Post Office Department into the U.S. Postal Service. This transformation was intended to "depoliticize" the subject of postal services, but rising postage rates, mounting postal deficits and the closing of small-town post offices has effectively "repoliticized" the issue.

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 systems are offering growing competition to first class mail, with electronic funds transfer systems a particular threat.

Numerous proposals for overhauling the structure and financing of postal services have been made in recent years. Changes in postal policy are inevitable because postal services are part of a larger information industry that is undergoing rapid growth and significant change both in technology and public policy. The resolution of postal policy issues is of national importance because postal services are an important component of the country's economic infrastructure and because resolution of postal issues can foreshadow possibilities for other communications sectors where competition and government intervention are at issue.

In April 1977, the Program began expansion of its postal policy research with the appointment of John F. McLaughlin as executive director of the Postal Arena. McLaughlin spent 12 years with the Postal Service, most recently as director of strategic planning. He has developed an agenda for postal policy research and is working with representatives of industry and government to establish plans and priorities for a comprehensive research program on the role of the mails in the national communications network.

POSTAL ORGANIZATIONS OPTIONS

In 1970, an attempt was made to convert the U.S. Post Office Department into a government corporation, independent of the fiscal and political control of the Congress. What resulted, after heated political debate and the first modern strike of federal employees, was a transformation of the Post Office into the U.S. Postal Service, an "independent agency of the Executive Branch."

Charles G. Benda is examining the politics

of the Postal Reorganization Act of 1970 along with the economic, political and social developments which led up to it. What caused the demand for a government postal corporation? What would have been the consequences of such an organization for major users, postal employees, and other interested groups? How did the legislation creating the Postal Service modify these expectations?

By focusing on the issues of labor relations and rate making, and on the historical importance of the Post Office, Benda's study not only addresses these questions but also attempts to show that the concerns surrounding postal reorganization exist in other areas of public policy. By drawing on general theoretical works on political processes and government organization, he indicates that the type

of organization used to address a policy area can significantly affect the policy which emerges.

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 Oettinger.

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 offers the reader an extensive introduction to postal statistics and rate-making machinery.

In particular, Imrie focuses on Docket E-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 E-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 establishments 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.

Figure 3.
POSTAL PATTERNS AND
PATRONS

There's more to postal services than an exchange of letters between two people. Businesses send more mail to households than they receive from households. Governments send out three times as much mail as they receive. In addition, message patterns vary — single message to single receiver; same message to many receivers — and types of mail service differ also — first-class, parcels, educational materials — creating very different markets.

Source: U.S. Postal Service, Market Research Division, USPS Market Study: An Update of the Kappel Commission Report, Study No. 2, Washington, D.C., March 1976, Table 6, p. 14.

PERCENTAGE OF SENDER-RECEIVER MAIL FLOW FOR POSTAL FISCAL YEAR 1974						
SENDER	RECEIVER					
	Business & Other Organizations	Households	Government	International Non-profit	Total	
	Business & Other Organizations	17.0	57.0	0.5	0.1	74.6
	Households	9.8	10.8	0.3	0.1	21.0
	Government	1.0	2.4	0.8	0.0	4.2
	Total	27.8	70.2	1.6	0.2	100.0

Totals may not add up due to rounding off.

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 re-organized 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 nonspeakers.

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 telephone 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 master's degree from Harvard in applied mathematics.

ARENA: COMMUNICATIONS (COMPUTERS - AND - COMMUNICATIONS)

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 AT&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 with the Federal Communications Commission in 1934, and hasn't given the subject much attention since then. Data processing was virtually manual labor at the time, and left unregulated. Now data processing and communicating have become almost indistinguishable, and the FCC is left with a problem. Its inquiry into the subject has been under way for six years. Elsewhere, the Justice Department has entered antitrust suits 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?

An introduction to national and international problems in the communications arena, *High and Low Politics: Information Resources for the 80s*, a collection of Program papers, was published in 1977 by Ballinger Publishing Co. of Cambridge, Mass. The volume includes three papers discussed below: Berman and Oettinger's "The Medium and the Telephone"; Berman's "Computers or Communications?"; and Read's assessment of the international communications arena, "Foreign Policy: High and Low Politics."

The emergence of communications was an early focal point of the Program's interests.

A NEW LOOK AT THE COMMUNICATIONS ARENA

The Program's preliminary layout of the Communications Arena is virtually complete. Kurt Borchardt has begun a project aimed at displaying the characteristics of the arena in detail and in depth.

Borchardt is rounding up descriptions of the players, issues, constituents and the scenes of action in the Communications Arena. His intent is to make the components of the arena and their relationships visible in one place for the first time.

The current version of the project is a chart dis-

playing for each player the characteristics (as seen by themselves and others), issues, objectives, constituents and means for resolving issues. It is likely that the effort of filling out these entries will be large, involving the participation of many Program researchers and affiliates.

Kurt Borchardt is a Research Fellow of the Program and former legal counsel to the Committee on Interstate and Foreign Commerce of the U.S. House of Representatives.

BEFORE THE U.S. CONGRESS

Program participants have been asked to testify before the U.S. Congress on four occasions this year:

- September 30, 1976
House. Committee on Interstate and Foreign Commerce, Subcommittee on Communications. Hearings on Competition in the Domestic Telecommunications Common Carrier Industry. Testimony by: Anthony G. Oettinger, John C. LeGates and Kurt Borchardt.
- March 23, 1977
Senate. Committee on Commerce, Science and Transportation, Subcommittee on Communications. Hearings on Domestic Common Carriers. Testimony by: Anthony G. Oettinger and John C. LeGates. (This testimony will be reprinted as an article in *Telecommunications Policy* in September 1977.)
June 8, 1977
- Senate. Committee on Foreign Relations, Subcommittee on International Operations. Hearings to examine impact of International Media,

Communications, and Information. Testimony by: Anthony G. Oettinger and John C. LeGates.

- June 24, 1977
House. Committee on International Relations, Subcommittee on International Operations. Hearings on Reorganizing Public Diplomacy. Testimony by: John C. LeGates.

In the Spring of 1977, the Program aided the Congressional Office of Technology Assessment in describing and discussing various information policy issues developing before the Congress.

Tony Oettinger, John LeGates and Kurt Borchardt were invited by OTA to participate in a three-month Working Group on Telecommunication, Computer and Information Policies. The Program has assisted in:

- Identifying and exploring issue areas
- Identifying stakeholders and their interests
- Organizing study strategies to conduct assessments.

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 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 Chairman.

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 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."

Excerpts from this paper appeared in the *Federal Communications Bar Journal*, Vol. 28, Nos. 2 and 3, 1975, under the title "Changing Functions and Facilities: The Politics of Information Resources".

Berman, who was with the Program from its inception, is a *magna cum laude* 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, *Computer 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 previous 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, Satellite 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.

Figure 4.

COMMUNICATIONS PRICES AND POLITICS

Prices for telephone calls are set through a complicated interplay of technology, economics, and local, state, and national politics. The charts illustrate evolving differences between in-state and interstate rates for toll calls.

Long-distance calls are among the most potent producers of telephone revenue. Since many of the same facilities are used for both in-state and interstate calls, setting rates is a matter of delicate adjustments and strong impacts. Pennsylvania's pegging of state rates of interstate rates was upheld by the U.S. Supreme Court in 1940. Rates in other states are usually higher than the interstate rates, but New Mexico dramatically reversed the relationship in the last decade.

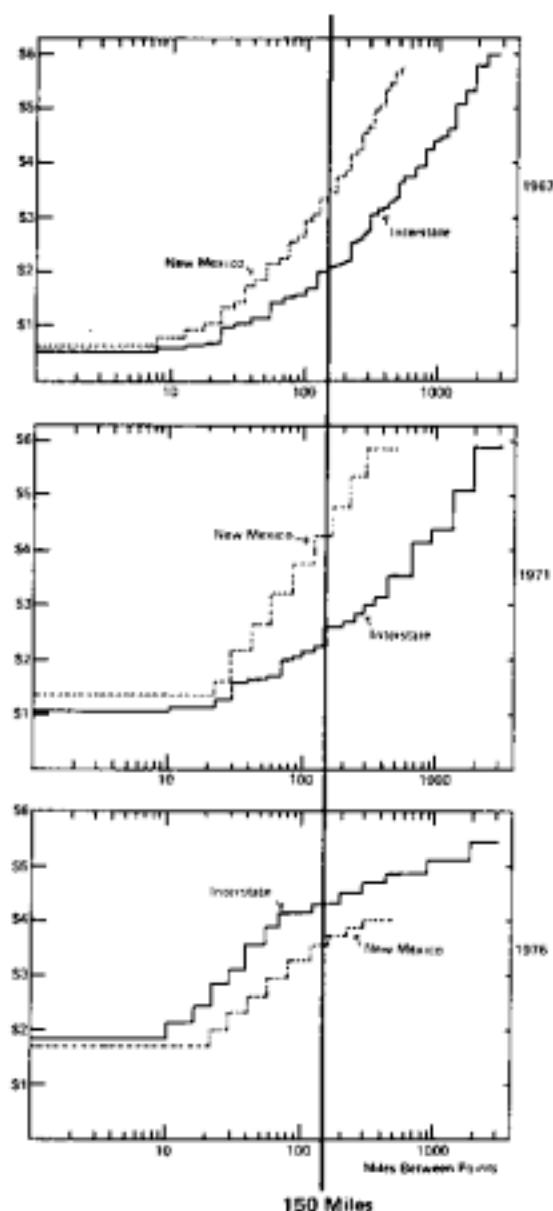
The charts cover only one kind of call, but long-distance telephone rates influence the costs of many communications services, from national broadcasting networks to telegrams to news and wire-photo services. See *The Medium and the Telephone* (p. 11 of this volume) for details on the rate-setting procedures and their impact on communications services.

Sources: Adapted from National Association of Regulatory Utility Commissioners, *Long Distance Message Toll Telephone Rates in Effect August 31, 1976*, Washington, D.C., 1976, and for earlier editions for June 30, 1971, and June, 1967.

American Telephone and Telegraph Co., *Bell System Statistical Manual, 1950-1975*, May 1976, 5800 — Volume of Communications, p. 805.

Rates for Operator-assisted, Person-to-person, Daytime Calls at a Distance of 150 Miles.

	Interstate	Iowa	Mass.	N.Mex.	Pa.
1967	\$2.10	\$4.00	\$2.25	\$3.35	\$2.10
1971	\$2.60	\$4.00	\$3.20	\$4.25	\$2.60
1976	\$4.30	\$3.65	\$5.30	\$3.55	\$4.30



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. After 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 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, 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 gov-

ernment 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 necessarily 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.

MONOPOLY, COMPETITION AND THE COMMUNICATIONS ACT

After years of treating telecommunications as a "natural" monopoly, the FCC has recently been encouraging competition in telecommunications services. Most notably, "foreign" attachments may now replace phone company instruments, and "specialized" common carriers may now compete for long-distance data transmission business.

Hamilton Loeb has been examining the legislative history of the FCC's charter — the Communications Act of 1934 — in an attempt to discover whether Congress intended to foreclose or encourage a competition in telephone and telegraph services.

The federal regulatory scheme for telecommunications began in 1910 with a cryptic floor amendment to the Mann-Elkins Transportation Act and was completed with passage of the Communications Act in 1934. In a Program working paper, *Communications Act Policy Towards Competition: The Sound of One Hand Clapping*, Loeb retraces Congressional de-

bate on these laws.

The dominant intent, Loeb finds, is the *provision of effective regulation*. Thus, he argues, the Act can most sensibly be read as granting the FCC nearly full powers over the market structure for telecommunications. Then, focusing on the "service to all" clause of the Act's preamble, he analyzes the contention that Congress envisioned a monopoly market.

Loeb concludes that the history and text of the Act are weighed in favor of permitting most forms of telecommunications competition, but his stronger conclusion is that Congress never has given the problems of telecommunications more than cursory attention and has failed to state an intelligible regulatory policy.

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

COMMUNICATIONS INTERNATIONALLY

THE HIGH AND LOW POLITICS OF INTERNATIONAL COMMUNICATIONS

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 communications 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 WUI "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 in-

terdependence, 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.

WARNING: RADIO SPECTRUM CRISIS AHEAD

Communications technology is a mainstay of the rich nations of the world; the radio spectrum is a mainstay of communications. The growing technology is controlled by the rich nations, but all nations, rich and poor, have a claim on the limited radio spectrum.

New rules allocating and regulating the use of the radio spectrum will be prepared at the World Administrative Radio Conference to be held in Geneva in 1979 by the International Telecommunications Union.

The last such conference, in 1959, was dominated by the industrial nations and limited largely to technical issues. Two-thirds of the delegates to the 1979 conference will come from the Third World.

In a Program working paper, **William Read** argues that the facts sketched above mean that the 1979 meetings are likely to be transformed by politi-

cal conflict into a "law of communications" conference much like the "Law of the Sea" conference.

In recent years the nations of the Third World have been testing just how far the industrialized countries will go in sharing energy, food and money, and Read argues that these nations will want their share of global information resources as well. Indeed, the Secretary General of the ITU, Mohamed Mili, has already stated, "The revision of the existing table of frequency allocations will be a positive contribution by the ITU to the introduction of a new international economic order."

In his paper, *Coming: A Law of Communications Conference*, Read discusses the resource value of the radio spectrum and the reasons for its emergence as a North-South issue. He examines the analogy with the Law of Sea conference and predicts some likely outcomes of the 1979 radio meetings.

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 has prepared 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 were 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.

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. By January 1976 some 24 states had 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 have 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.

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.

The report of this project, *The Explosion of State Laws on E.F.T. Systems*, is available from the Program. A related article, "E.F.T. Systems and State Laws," appeared in *The Banking Law Journal* of May 1976.

Prives has completed the fourth year of a program leading to a combined degree in law and business administration at Harvard and has joined the Insurance Company of North America.

BRANCH BANKING, E.F.T. AND THE COURTS

The "oldest" of the E.F.T. issues is the relation of remote electronic arms of banks to the laws on branch banking. More broadly, the issue is how to accommodate E.F.T. developments to the laws mapping out the turfs of various financial and non-financial institutions. For the most part, these accommodations have been made by the courts, rather than by legislative or executive action.

In his Program publication, *E.F.T. Policy and Competitive Equality: The Roles of Court and Congress*, Daniel Prives examines recent decisions by the Supreme Court determining that certain E.F.T. systems fall within the regulation of the federal McFadden Act, which places national banks under the branch-banking restrictions of the laws of their home states. The decisions were based on a "policy of competitive equality" between state and national banks derived by the courts from the McFadden Act.

Through an in-depth analysis of the precedents relied on and of the legislative history of the McFadden Act, Prives demonstrates that in two leading cases of the 1960s, the Supreme Court itself created a policy of competitive equality which bears little resemblance to the policy found in its previous decisions on national banks or to the legislative in-

tent of Congress.

This creation was necessary, Prives argues, because the changes in national banking services in the 1960s raised questions about bank competition for which the McFadden Act and previous decisions provided no answers. *The absence of a national policy on service competition in banking led the Supreme Court to create a policy.*

This court-made policy led to the present court-made accommodation of E.F.T. systems to branch-banking regulation. Prives suggests that this procession of events illuminates the limitations of the courts in accommodating E.F.T. systems to industry boundaries. The courts did not consider whether their policy of competitive equality established sensible boundaries between state and national banks, nor did they examine the impact of their rulings on non-financial institutions with an interest in E.F.T. or their impact on the public at large. For these reasons, Prives suggests that Congress might want to re-examine the issues raised in the E.F.T. cases.

This paper was submitted to the National Commission on E.F.T. in conjunction with oral testimony by Prives in October 1976.

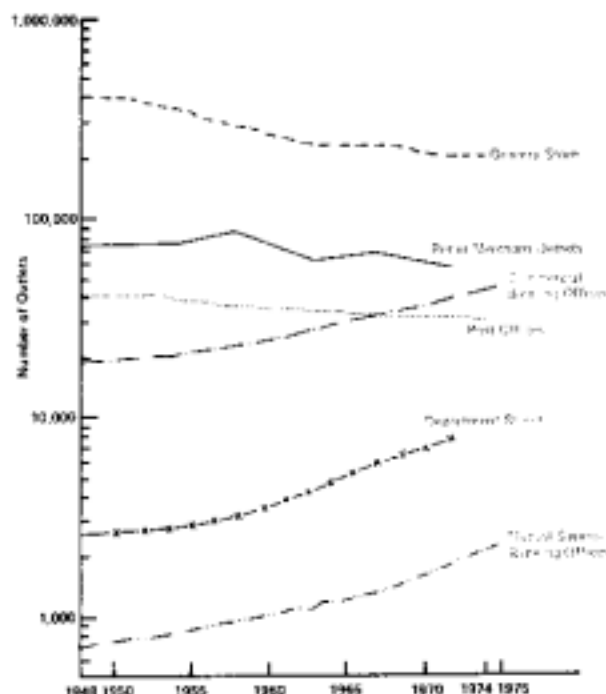
Figure 5.
TAPPING THE CONSUMER
CASH FLOW

Sears, Roebuck: Nation's Banker?

Source: *The New York Times Magazine*,
November 28, 1976

Traditional technologies can also be used in new ways. Sears Roebuck has nationwide financial reach, starting with the consumer at home and using telephone, mails and the United Parcel Service in concert with its many retail outlets and order offices, and its savings and loan services in California.

New technology has intensified battles over control of the consumer's money. An electronic terminal "to handle all your financial needs" can be installed anywhere a phone booth can go. The chart, on the right, only covers industries already active in this marketplace. Other likely entrants include finance companies, national credit systems, reservations and ticket agencies.



All information systems are becoming compatible with each other, including the public communications media — magazines, the press, publishing, cable TV, movies and broadcasting. Problems with the FCC may 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 now commonplace. Magazines and newspapers depend on low postal rates. Movie and television production and distribution have moved in together. Cable television could be the beginning of a process that might 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.

After the Postal Services Arena, the Media Arena has progressed furthest in the Program's planned expansion. The Executive Perspective-Building Forum helped set the agenda and launch the work. Further development of the arena will be explored in 1977-78.

EXECUTIVE PERSPECTIVE - BUILDING FORUM

More than 20 media executives came to Cambridge in February 1977 to join with a dozen discussion leaders from Congress, the information industries, and the universities in the Executive Perspective-Building Forum sponsored by the Program with the Nieman Foundation for Journalism.

The theme as announced was:

"Today, major political, legal, economic and technological factors are altering or eliminating the historic barrier among information industries and making new alternatives available to information users. What happens to one information industry strongly affects not only all the others but also the public generally. These relationships are increasingly recognized, but little is known about their effects on either the industries or the public. Fresh approaches are needed to meet this new situation."

Several participants have already expressed interest in additional meetings and two of them have already hired people to work full time following up avenues that were opened for them at the forum. One assigned an employee to the Program as a Visiting Affiliate for three months (see page 22).

Participants in the forum included:

Stanley Asimov, *Newsday*, Inc.
John R. Bennett, Transamerica Information Services
Kurt Borchardt, Program on Information Resources Policy

David L. Bowen, The Associated Press
Howard J. Brown, *Kenosha News*
James E. Burgess, Lee Enterprises, Inc.
Jack E. Chinn, Canadian International Paper Company
Thomas C. Fichter, American Newspaper Publishers Association
Larry Franklin, Harte-Hanks Newspapers, Inc.
Jerry W. Friedheim, American Newspaper Publishers Association
Aristotle Gavras, Transamerica Information Services
Dean Gillette, Bell Laboratories
Bill Gullledge, Harte-Hanks Newspapers, Inc.
Leonard R. Harris, The New York Times Company
John C. LeGates, Program on Information Resources Policy
Anthony G. Oettinger, Program on Information Resources Policy
William H. Read, Program on Information Resources Policy
Lloyd G. Schermer, Lee Enterprises, Inc.
Otto A. Silha, *Minneapolis Star and Tribune* Company
Theodore L. Simis, American Telephone and Telegraph Company
C.W. Skarstedt, Canadian International Paper Company
John I. Taylor, The Boston Globe
James C. Thomson, Jr., Nieman Foundation for Journalism
Peter Urbach, National Technical Information Service

Figure 6.
BLURRED MEDIA BOUNDARIES



Program Affiliates, 1976-1977 in Broadcasting and Motion Pictures.

Blurred boundaries characterize the information industries. The chart shows business activities of nine Program affiliates involved in the entertainment media — movies, radio and TV, cable and broadcast. These firms compete not only in entertainment, but often across the board. In many cases, they also compete internally, as between entertainment and publishing divisions. In some firms, these corporate pieces have little connection except on paper. In others, plant, staff and management may be shared. Competition covers not only markets and revenues, but laws and regulations and corporate strategies as well.

The discussion leaders were:

William O. Baker, Bell Laboratories
Derek C. Bok, Harvard University
Lewis M. Branscomb, IBM Corporation
John T. Dunlop, Harvard University
J.T. Ellington, Jr., United States Postal Service
Martin Ernst, Arthur D. Little, Inc.
William F. Kerby, Dow Jones and Company, Inc.
Maurice Lazarus, Federated Department Stores, Inc.

Aimee D. Leifer, Harvard Graduate School of Education
Herbert E. Marks, Wilkinson, Cragun and Barker
Gale W. McGee, United States Senator
Richard S. Rosenbloom, Harvard Business School
Jerome S. Rubin, Mead Data Central
Donald A. Thurston, Berkshire Broadcasting Company, Inc.
Alan F. Westin, Columbia Law School
Timothy E. Wirth, United States Representative

MINNEAPOLIS STAR AND TRIBUNE

After participating in the Executive Perspective-Building Forum, the Minneapolis Star and Tribune Company has hired two consultants to follow up on the ideas presented. One of these, **James C. Ezzes**, has been directed to examine the information industries outside the newspaper organization. Ezzes

has begun his work by joining the Program as a Visiting Affiliate for three months. He familiarized himself with the people and documents of the Program, and prepared a paper on a topic of mutual interest to the Program and the company.

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*.

THE LOGISTICS OF LOCAL NEWS

What are the logistics of the delivery of information by a local newspaper? How does the local paper get the right combination of information to the right customers at the right time?

In his Program publication, *Information Logistics: Local Distribution of Information*, **Wallace P. Wormley** treats the local newspaper as an information product in an unstable state. It is unstable because its traditional subproducts, roles and markets are all mutable and are now under challenge.

Wormley first examines favorable and unfavorable current trends in the newspaper industry and then surveys developments in electronics and

physical distribution that may change the local delivery of information products.

Wormley holds a Ph.D. from Harvard in psychology. He graduated in psychology and physics from Howard University. His study was conducted while he held a joint appointment as Research Fellow from the Program and the Business School. He left the Program to join the Bond and Commercial Loan Department of the Prudential Insurance Company. Recently he has worked on long-term loans to firms in the telecommunications, public-utilities, semiconductor and data-communications industries. He maintains interest in and close ties with the Program.

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 addressed 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 analyzes 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 delegated 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 direction and issued as a Program publication. A later version was published in 1976 by Ballinger Publishing Co. of Cambridge. Berner is 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 customary 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.

A new book, *The Regulation of Innovations in the Broadcasting Market*, based on Mosco's research, will be published by Ablex Publishing Corporation of Norwood, New Jersey in late 1977.

Mosco is chairman of the sociology department at the University of Lowell and a Research Fellow of the Program. He has been awarded a fellowship in international information resources by the White House Office of Telecommunications Policy. He will spend 1977-78 studying how policy for international telecommunications is made by the U.S. government.

STATE REGULATION OF CABLE TELEVISION: A NEW GRANT

Cable television is a political and regulatory issue in most of the 50 states. Eleven states have enacted broad regulatory statutes on cable TV, and others have such regulation under active consideration. Several states have also passed specific laws on pole attachments, taxation, or theft of service that affect the development of cable television. Others have left regulation to the FCC and local governments, while waiting for the dust to settle or some pattern to emerge at the state level.

Connecticut, Massachusetts, Minnesota, New Jersey, and New York, among others, already have state regulatory agencies. California, Illinois, Michigan, and Pennsylvania are among those actively considering broad legislation. In addition, recent FCC directions and Congressional reexamination of the Communications Act of 1934 suggest that the state role in cable television could change considerably in the next few years.

In February 1977, the Program received a grant from the National Science Foundation for an 18-month study of state regulation. The study, which is being conducted with Kalba Bowen Associates, will address the political dynamics, legal options, regulatory issues, and economic consequences of state government involvement in cable television. Among the questions that will be researched are:

- How have state legislatures decided to regulate cable TV to date? What groups have had the greatest influence over this process? How have decisions concerning whether to place the regulatory responsibility in a public utility commission (as in Connecticut or Nevada) or to create a new agency (as in Massachusetts, Minnesota and New York) been made?
- What laws have actually been passed? How do the regulatory agencies differ with respect to the regulatory and non-regulatory respon-

sibilities assigned them? How have they executed regulations over rates, line extension, or franchising procedures? And what court decisions or federal actions, have constrained the scope of state regulation?

- Does state regulation have any impact on the growth of cable television? Has it aided or hampered securing capital, obtaining new franchises, or expanding services? Does regulation increase or decrease the costs of operating a cable system, or alter the types of services provided?
- What organizational factors should be taken into account in allocating cable television regulation? Are the states equipped to implement regulatory policies? Are their policy concerns different from those of the FCC or localities? Based on existing experience, what relationships are state commissions likely to establish with the cable industry, adversary or cooperative? How effectively can state regulators deal with technical, consumer, and rate issues?

The project will issue a series of research reports as it works, and then a final book after all research is completed.

The project director is **Kas Kalba**, president of Kalba Bowen Associates. Kalba chaired the planning committee that developed the Program's original direction and has been affiliated with the Program ever since. He is a visiting lecturer in political science at MIT and organized the MIT Communications Policy Series in 1976-77.

Senior legal analyst for the project will be **Philip R. Hochberg** of the Washington firm of O'Connor and Hannan. Hochberg has practiced broadcasting law since 1965, including two years at the FCC, and has written several articles on CATV law. The project's economic consultant will be **Yale**

M. Braunstein, assistant professor of economics at New York University for the past three years, who is joining the Brandeis University economics faculty this year. The project's senior research assistant will be **Larry S. Levine**, who wrote a master's thesis on

franchising CATV in Madison, Wisconsin. Levine has also worked with the Massachusetts CATV Commission. He is on leave from doctoral studies in political science at MIT.

NATIONAL ASSOCIATION OF BROADCASTERS

The National Association of Broadcasters has asked the Program to help create a series of educational conferences to familiarize broadcasters with the forces within broadcasting and outside it that are shaping the evolution of the broadcasting industry. The conferences will draw participants — both speakers and listeners — from broadcasting, gov-

ernment, and other information players.

The Program is represented by John LeGates, Bill Read and Tony Oettinger at the NAB's planning meetings for the conferences and in informal follow-up discussions, and at the conferences themselves.

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 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.

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 re-

lationships 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 Chairman of the Program. He and **John LeGates**, the Program's Director, have been asked by the Minneapolis Public Library and Information Center to help design a workshop for Minneapolis library staff members on information resources.

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.

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 Thomson, 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 completed the J.D. degree at Harvard Law School in June 1977.

Decisions on information systems and services grow more complex for individual private and public managers as the market offers more and more alternatives that are both useable and affordable.

On the personal level, the hand-held calculator has brought strong computational capacity to every desk, changing the demands made on the large central computer. At the same time, the central systems have become more useful with low-cost terminals and increased flexibility.

On the institutional level, there are large systems that will serve the whole organization and also allow quick individual access to massive data and report-generating resources.

And, as institutional information needs have become world-wide with the growth of international, multinational and transnational organizations, information specialists from outside the organization have become an important factor in the market.

Management communications make a major contribution to the global information flow, but they can also be the source of political difficulties within the organization, or in the national and international political environment.

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 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.

A revised version of his working paper will be published this year in *Accounting, Organization, and Society*, a quarterly published by Pergamon Press, Ltd., Oxford, England.

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:

- Description of how corporations use information.
- 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

The issues of privacy and access were familiar to the makers of the pyramids, both pharaoh and slave. The technology has gone from papyrus scrolls to tape reels, but the conflict has not changed:

- 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 RIGHT TO PRIVACY IN AMERICAN HISTORY

David J. Seipp examined 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 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 census data that could be identified with in-

dividual 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 graduated from Harvard College *summa cum laude* in history in 1977. He plans to do graduate study at Oxford and then to return to the Program and Harvard Law School.

PRIVACY AND THE REGULATION OF INFORMATION SYSTEMS

David Seipp has reported 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.

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 COMPROMISE

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, arguing 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.

Figure 7.
REACHING VARIED PUBLICS —
THROUGH PROGRAM PUBLICATIONS



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, has continued the collection of this data, extending it into time series and developing descriptions of additional industries. Weinhaus was assisted by Lawrence Beyer and Irwin Hipsman. This work is available to

the Program's researchers, but has not been published.

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, receiving the diploma in economics. During that year, he also worked on long-range telecommunications studies for the British Post Office, using macro-economic data to estimate the size of the market for information services.

Lavey is now in his second year at the Law School. He will work this summer for the law firm of Sidley and Austin in Chicago and for the First National Bank of Chicago.

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 Le Duc 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 directed by Weinhaus, with the assistance of Laura Brody.

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 matters 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 data processing technology.

In December 1976, Phister's book, *Data Processing Technology and Economics*, was published by the Santa Monica Publishing Co., Santa Monica, Ca.

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, inter-twinings, 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, a member of the editorial review board of *Trans-*

portation Journal, and staff associate at the Institute for Government Services at the University of Massachusetts in Amherst. He served this year on the MIT panel on Citizens Band Radio and Federal Regulation.

Some earlier research on Grand Central Terminal, the "pyramid complex" and their relation to rate-base regulation was published in reports by the Office of Midtown Planning of New York City for the Urban Mass Transportation Administration, and for a report on land-use relationships to transit for the Office of Policy and Plans of the Department of Transportation. The fruits of this research are also to appear late in 1977 in *Co-Evolution Quarterly* under the title, "J.P. Morgan and the Origin of the American Pyramid Complex".

The Program teaches undergraduates and graduate students at Harvard and provides text materials used in schools, industry and government. Our teaching is a fundamental part of the Program's work, both in aiding research and disseminating research results.

Undergraduates in Harvard College and graduate students in the Schools of Arts and Sciences, Business, Government and Law have requested advice and guidance from the Program. Some have sought help on a particular project, others have formally included information resources policy in their study plans. Among the latter, Charles Benda, Paul Berman, Richard Berner, Larry Beyer, Charles Brackbill, Paul DiMaggio, Gordon Imrie, Arlene Karlin, Warren Lavey, Hamilton Loeb, Vincent Mosco, Daniel Prives, David Seipp, Wallace Wormley, and Nikki Zapol are contributors to Program research. Berman, Berner, Beyer, Karlin, Lavey, Prives, and Seipp were undergraduates at the time they joined the Program.

Two courses (Figure 8) are closely associated with the Program in both subject matter and participating faculty. One is a graduate seminar in the Public Policy Program of the Kennedy School of Government. The other, primarily for undergraduates, is offered as a General Education course through the Faculty of Arts and Sciences.

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

Cross-fertilization between teaching and research is encouraged. For example, Carol Weinhaus assisted in an earlier course, *Communication in Societies*, by taking charge of video facilities and supervising students in video experiments. She collaborates in instructing the students in research techniques and in coordinating the mechanics of both current courses. Paul Berman and Daniel Prives became interested in research in information policy as students in *Communication in Societies* and later, along with Nikki Zapol, served as Teaching Assistants and as Research Fellows. Warren Lavey, David Seipp, and Daniel Prives

are among 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. Many students are now seeking degrees with 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.

The Program has sold dozens of copies of its publications for use in universities, industry and government. *The Regulation of Broadcasting in the United States* by Vincent Mosco was cited as "especially useful" for the preparation of *Option Papers* issued in April 1977 by the U.S. House Subcommittee on Communications. Ballinger Publishing Co. has published two commercial books based on Program publications, *Constraints on the Regulatory Process: A Case Study of Regulation of Cable Television* by Richard Berner and *High and Low Politics: Information Resources for the 80s* by Anthony G. Oettinger, Paul J. Berman and William H. Read.

The Program's teaching is not confined to books or the classroom. Other teaching modes include oral presentations by Program staff at other universities, Congressional testimony, the Faculty Seminars and other exchanges with industry and government people and special workshops such as the Executive Perspective-Building Forum described in Section 2.

Figure 8.
REACHING VARIED PUBLICS—
THROUGH TEACHING WITHIN THE UNIVERSITY

Information Resources and Public Policy
Public Policy

Anthony G. Oettinger

Generalist and expert roles in shaping the complex socio-technical systems that marshal and distribute the world's resources—economic and social—have emerged as a primary force, and technology leads into an extensive study of information resources as a case in point: television, newspaper, postal, telephone, computer and other information systems as they intertwine in serving the public. Among the perennial issues considered, quality and control of service, incidence of externalities and other benefits and burdens, distribution of power and control. Emphasis is on understanding how scientific, technological, economic, legal and political factors interplay as the issues are confronted by private and public policy makers.

Not a competency course. Final examination; extensive research expected of graduate students who elect this course. Prerequisite: Economics 10 or elementary calculus for credit.

Half course (fall term). M. W. 2-3:30 (VII/VIII)

Information Resources and Public Policy
Information Policy

Anthony G. Oettinger and William H. Read

The roles of public and private institutions, of generalists and of experts in dealing with scarce or basic resources, and the political and economic and technological changes involved in the use of public facilities among other distinctive elements of postal, library, telephone, computer and other information facilities, services and institutions to shed light on problems of public intervention in markets. Through research papers based on their specialties, students are expected to deepen their understanding of how the factors less prominent in economic, political, legal, economic, technological and scientific factors interplay in policy analysis and decision-making. Research papers should aim at making a substantive contribution in the selected problem area.

Prerequisite: Social Sciences 10 or permission of an instructor.

Half course (spring term). M. W. 2-3:30 (VII/VIII)

September 27

An Exploration of the Long Term Development of Telecommunications in Australia

Alexander J. Wearing, Professor in Psychology, University of Melbourne

October 18

National Commission on Postal Service: An Opportunity to Rethink the Traditional Role of Postal Services in a Changing World

John F. McLaughlin, Director, Office of Long Range Policy Planning, United States Postal Service

October 25

The Developing Current of EFTS

George Gordin, Jr., Senior Attorney, J. C. Penney Company, Inc.

November 1

A Management View of On-Line Banking

Mark Polansky, Manager of Market Development, Bunker Ramo Corporation

Figure 9.

**REACHING VARIED PUBLICS —
THROUGH PRESENTATIONS**

I.P.T.C. Newsletter

No. 37

May
1977

Joint Editors: W. Ward-Johnson
Oliver Robinson

International Private Telecommunications Council
4th Floor Street, London, EC1

LEASE LINE CHARTER TOPS AGENDA

A PRIVATE LINE USERS CHARTER, prepared by a working party chaired by Mr. Alexander Noble, is likely to be a major feature of IPTCS 12th Annual Meeting in Boston during the week beginning May 22nd.

It should prove a controversial document—and will be discussed at a time when the whole future of private leased lines and the tariff to be applied to them are in the melting pot.

Equally important will be the report of Director Oliver Robinson, who has had an exceptionally active and fruitful year highlighted by his visit to Baghdad to attend the meeting of the international committee of experts formed to study the improvement of direct telecommunications among non-aligned countries.

The possible need for concessionary tariffs was on the committee's agenda.

Confidence is to be inspired by Dr. Abraham F. Sykes, of the U.S. National Oceanic and Atmospheric Administration.

Main speakers will be:

Advanced Communications Committee. Anthony G. Göttinger, Director of Programs on Information Technologies and Public Policy, Harvard University.

Facsimile Committee. Glen Jenkins, Assistant to the National Pres-



ANTHONY G. GÖTTINGER

High Speed Committee. Professor I. R. Bentley, Electronic Systems Laboratory, Massachusetts Institute of Technology.

Tariffs and Facilities Committee. Earl S. Babbitt, Common Carrier Bureau, Federal Communications

November 22

Can the Dinosaur Learn New Tricks? The Predicament of the European PTT's in the Market for Specialized Message and Data Services

Michael Tyler, former Loeb Fellow in Advanced Environmental Studies

November 29

Telecommunications Policy - The Future is Now

Herbert E. Marks, Attorney, Wilkinson, Cragun & Barker

December 6

Results of the National Commission on E.F.T.

Eugene M. Tangney, Senior Vice President, The First National Bank of Boston

December 13

The Postal Reorganization of 1970: Why It Happened

Charles G. Benda, Ph.D. candidate, Department of Sociology; Research Assistant, Program on Information Resources Policy, Harvard University

February 7

Policy Issues in Office Automation Technology

General Harold R. Johnson, President, Capitol Institute of Technology

February 14

The FED and E.F.T.

Laurence Stone, Vice President and General Counsel, Federal Reserve Bank of Boston

March 7

Electrical Technologies in the Newspaper Industry

J. Francis Reintjes, Professor of Electrical Engineering, Massachusetts Institute of Technology

March 14

Major Communications Policy Issues at the FCC

Daie Hatfield, Director, Office of Plans and Policy, Federal Communications Commission

March 21

The Information Services Marketplace

John E. Austin, Lecturer on Business Administration, Harvard Business School

April 11

The Corporation and EFT: A Banker's View

Michael R. Zook, Vice President, Northern Trust Bank, Chicago

April 25

Collecting, Analyzing and Communicating National Intelligence

Ray S. Cline, Executive Director of Studies, Georgetown University, Center for Strategic and International Studies

May 2

The Information Services Marketplace: A Vendor's View

John Rothman, Director of Research and Information Technology, The New York Times Company

May 16

Telephone Separations and Competition

James W. Sichter, Revenue Planning Analyst and Basil J. Boritski, Vice President, Revenues, United Telecommunications, Inc.

May 23

Postal Service as a Public Service

Coleman Hoyt, Vice President, Distribution, Reader's Digest

Argyris, Chris

November 10, 1976

Presentation on "What inhibits or enhances the capacity of organizations to detect and correct errors." Columbia University Seminar on Computers and their Relation to Man and Society, New York, N.Y.

Austin, John E.

April 18-21, 1977

Panelist, session on "Educating the Information Manager," National Information Conference, Information Industry Association, Washington, D.C.

Borchardt, Kurt

September 30, 1976

Hearings on Competition in the Domestic Telecommunications Common Carrier Industry, House Committee on Interstate and Foreign Commerce, Subcommittee on Communications, Washington, D.C.

Clippinger, John H.

January 24, 1977

Presentation on "Information Resource Sharing with the Third World," Aspen Institute sponsored talk on the desirability of global datanets for less developed countries at Brookings Institute, Washington, D.C.

Kalba, Kas

March 16, 1977

Panelist, session on rate regulation, FCC conference on "Federal-State-Local Cable Television Relations — A Reappraisal," Washington, D.C.

Academic year 1976-77

Organizer of M.I.T. Communications Policy Seminar series.

December 14, 1976

Paper presented to the Harvard Ukrainian Research Institute and the Harvard Library Club, "The Information Marketplace and the Obsolescence of Traditional Libraries."

LeGates, John C.

June 24, 1977

Hearings on Reorganizing Public Diplomacy, House Committee on International Relations, Subcommittee on International Operations, Washington, D.C.

June 8, 1977

Hearings to examine impact of International Media, Communications, and Information, Senate Committee on Foreign Relations, Subcommittee on International Operations, Washington, D.C.

May 3, 1977

Working Group on Telecommunication, Computer and Information Policies, Office of Technology Assessment, United States Congress, Washington, D.C.

March 23, 1977

Hearings on Domestic Common Carriers, Senate Committee on Commerce, Science and Transportation, Subcommittee on Communications, Washington, D.C.

November 9, 1976

Presentation, "The Future of EFTS: An Academician's View," at Payment Systems, Inc.'s International Symposium on Electronic Funds Transfer Systems in the United States, Geneva, Switzerland.

September 30, 1976

Hearings on Competition in the Domestic Telecommunications Common Carrier Industry, House Committee on Interstate and Foreign Commerce, Subcommittee on Communications, Washington, D.C.

McLaughlin, John F.

May 25, 1977

Presentation, "The Challenge of Electronic Message Service: How Far, How Soon," Postal World Seminar on Alternative Delivery Services, Washington, D.C.

Oettinger, Anthony G.

June 20, 1977

Opening address, conference of National Association of Broadcasters, Airlie, Va.

June 8, 1977

Hearings to examine impact of International Media, Communications, and Information, Senate Committee on Foreign Relations, Subcommittee on International Operations, Washington, D.C.

May 25, 1977

Address to International Press Telecommunications Council meeting, Boston, Mass.

May 4, 1977

Presentation on the relationship between computers and telecommunications, Thomas J. Watson Research Laboratory, IBM, Yorktown Heights, New York.

May 2, 1977

Working Group on Telecommunications, Computer and Information Policies, Office of Technology Assessment, United States Congress, Washington, D.C.

April 27, 1977

Presentation on Information Resources Policy, MITRE Corporation, McLean, Va.

March 30 - April 2, 1977

Fifth Annual Telecommunications Policy Research Conference, Airlie, Virginia. Panelist, session on Policy Relevant Research: Formal Coordination of Government Needs and Non-Government Resources. Chairman, session on Computers/Communications.

March 23, 1977

Hearings on Domestic Common Carriers, Senate Committee on Commerce, Science and Transportation, Subcommittee on Communications, Washington, D.C.

Figure 10.

**REACHING VARIED PUBLICS —
THROUGH WORKSHOPS AND CONFERENCES**



Pick Stafford

March 16-18, 1977

Panelist, "Future of the West" conference, Center for Study of the American Experience, Annenberg School of Communications, University of Southern California, Los Angeles, Ca.

February 11, 1977

MITRE Corporation seminar on Issues Arising from Computer/Communications Technology, Williamsburg, Va.

December 14, 1976

Session on Technology and Society, AT&T's Employee Communications Program, Video teleconference originating in Boston, Mass.

December 7, 1976

Session on Technological Thresholds for Distributed Data Processing, International Data Corporation, Hilton Head Island, S.C.

November 16, 1976

Quarterly Board Meeting, Computer and Communications Industry Association, Boston, Mass.

October 13, 1976

Computer Law Association panel discussion on "The Interdependence of Computers and Communications: Regulatory Options," Washington, D.C.

September 30, 1976

Hearings on Competition in the Domestic Telecommunications Common Carrier Industry, House Committee on Interstate and Foreign Commerce, Subcommittee on Communications, Washington, D.C.

June 29, 1976

Corporate Policy Seminar, American Telephone and Telegraph Company, Princeton, N.J.

Prives, Daniel

October 29, 1977

Hearings, National Commission on Electronic Fund Transfers, Washington, D.C.

Read, William H.

May 11, 1977

Respondent, MIT Communication Policy Seminar on "International Threats to Freedom of Communication," Cambridge, Mass.

Wormley, Wallace P.

September 25, 1976

Presentation, "Data Communications: What Is It? Where Did It Come From? Where Is It Going?" Mercer County Business and Professional Women's Club, Trenton, N.J.

April 29, 1977

Presentation, "Uses of Data Communications to Improve Health Care Services," Executive Committee of the National Dental Association, Summit, N.J.

June 6, 1977

Presentation, "Investment Trends in the Semiconductor Industry," Bond and Commercial Loan Department, Prudential Insurance Company, Newark, N.J.

Westin, Alan F.

April 19, 1977

Speech on "Civil Liberties Implications," Sixth Annual Payment Systems Symposium, Payment Systems, Inc., Atlanta, Ga.

February 24, 1977

Speech on "Privacy and Credit," Second Annual Automation Seminar of the Associated Credit Bureaus

December 1976

Speech on "Emerging Employer and Executive Privacy Issues," First National Forum on Business, Government, and the Public Interest, American Management Associations, Washington, D.C.

October 26, 1976

Testimony, "Possible Effects of EFT on Privacy and Consumer Interests," National Commission on Electronic Fund Transfers, Washington, D.C.

6

PUBLICATIONS 1976-77

OUTSIDE PUBLICATIONS

Berman, Paul J. and Oettinger, Anthony G. "Changing Functions and Facilities: The Politics of Information Resources," *Federal Communications Bar Journal*, Vol. 28, Nos. 2 and 3, 1975, Special Combined Issue.

Berner, Richard. *Constraints on the Regulatory Process: A Case Study of Regulation of Cable Television*, Ballinger Publishing Co., Cambridge, Mass., 1976.

Capron, William M. "Congressional Support Agencies." A Compilation of Papers prepared by the Commission on the Operation of the Senate, U.S. Government Printing Office, Washington, D.C., 1976.

Kalba, Kas. "The \$64,000,000 Question: Predicting the Home Video Programming Market," *Videography*, Vol. 2, No. 2, February 1977.

Meyer, John R. and Gomez-Ibanez, J.A. "Improving Urban Mass Transportation Productivity," *Final Report* prepared for the U.S. Department of Transportation, Urban Mass Transportation Administration, February 1977.

"Transportation Regulation," *Challenge*, Vol. 19, No. 5, November-December 1976, p. 44-46.

Oettinger, Anthony G., Berman, Paul J., and Read, William H. *High and Low Politics: Information Resources for the 80s*, Ballinger Publishing Co., Cambridge, Mass., 1977.

Read, William H. *America's Mass Media Merchants*, The Johns Hopkins Press, Baltimore, Md., 1977.

PROGRAM PUBLICATIONS

Annual Report 1975-76. Harvard University Program on Information Resources Policy
Volume One. *Information Resources Policy: Arenas, Players and Stakes*
Volume Two. *Information Resources Policy: Program Projects*

Read, William H. *Communications Policy: An Agenda*, 18 pages, May 1977.

What should be the agenda for the makers of communications policy? This paper identifies and comments briefly on some agenda items where the policy process appears inadequate, including international telecommunications, national security, and the more traditional issues of antitrust policy and industrial competition. This paper does not claim to be exhaustive, but only to surface some important issues.

Read, William H. *Coming: A Law of Communications Conference*, 14 pages, April 1977.

Communications technology is a mainstay of the rich nations of the world; the radio spectrum is a mainstay of communications. The growing technology is controlled by the rich nations, but all nations, rich and poor, have a claim on the limited radio spectrum. New laws allocating and regulating the use of the radio spectrum will be prepared at the World Administrative Radio Conference to be held in Geneva in 1979 by the International Telecommunications Union. This "warning" paper argues that the 1979 meetings may be transformed by political conflict from a technical meeting to a "law of communications" conference much like the "Law of the Sea" conference, with sharp North-South conflict.

Loeb, Guy Hamilton. *The Communications Act Policy Toward Competition: The Sound of One Hand Clapping*. 68 pages. March 1977.

This paper examines the legislative history and text of the Communications Act of 1934 seeking Congressional intent regarding competition in telecommunications. It traces the development of federal regulation from its birth in a cryptic floor amendment to some transportation legislation in 1910 through the passage of the current law in 1934. The paper analyzes power over market structure granted to the FCC and the contention that Congress intended a monopolistic market structure.

Beyer, Lawrence, Hipsman, Irwin, and Weinhaus, Carol. *Information Industries: Patterns of Activities, Regulation, and Sales*. 22 pages. February 1977.

This working paper consists of four charts about the information industries and the background material for these charts. The charts show patterns of activities, regulation, and sales. The particular order and groupings in each of the charts is not the only possibility. However, in each chart an attempt was made

to concentrate specific activities or to rank by size or sales. Most of the information was obtained from annual reports and therefore some companies may not have all their activities listed.

Sichter, James W. *Separations Procedures in the Telephone Industry: The Historical Origins of a Public Policy*. 146 pages. January 1977.

Long-distance service is one of the most potent sources of telephone revenues. Since a long-distance call may involve more than one telephone company and more than one regulatory agency, complicated procedures for intercompany settlements have been devised to assure each provider of service with a fair share of the revenues and each user with a fair price for the service. This paper explains how these procedures evolved and how they operate today.

Prives, Daniel. *E.F.T. Policy and Competitive Equality: The Roles of Courts and Congress*. 52 pages. January 1977.

The absence of a national policy on service competition in banking in the 1960s as banking

Figure 11.

REACHING VARIED PUBLICS — THROUGH CONGRESSIONAL TESTIMONY



competition was greatly increasing led the courts to create a national policy. This paper presents an in-depth analysis of recent court decisions bringing electronic funds transfer systems under the terms of the McFadden Act, which places national banks under the branch-banking restrictions of their home states. The paper focuses particularly on the origins of the "policy of competitive equality", a policy not to be found in court precedents or legislative debate over the McFadden Act.

LeGates, John C., and Oettinger, Anthony G. *Prospectus for the Expansion of the Program on Information Resources Policy*. 15 pages. October 1976.

The Program perceives a rising need for its services but the limits of the present structure and staff are close at hand. The expansion aims to meet the need for a national forum for in-depth analysis of issues and development of policy options in the overlapping information arenas.

Benda, Charles G. *Postal Policy: Issues, Interests and Options*. 24 pages. October 1976.

The social and political circumstances of the re-

cent past and present dictated the postal reorganization of 1970. This paper studies the changing role and function of the post office in American history, with particular emphasis on the new arrangement.

LeGates, John C., Oettinger, Anthony G., Read, William H., and Weinhaus, Carol L. *Foreign Policy Choices for the 1970's and 1980's - Information Resources, Strategic Strengths - Strategic Weaknesses*. 63 pages. October 1976.

Information is the transforming and strategic resource of American society today. Already one out of every two Americans is employed in the information sector. And the expanding information sector accounts for more than 20 percent of America's GNP. America's 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. The crucial policy question then is: Must there be an international "crisis" to get the United States to act on information resources?

Figure 12.

**REACHING VARIED PUBLICS—
THROUGH DIVERSE PUBLICATIONS**



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

The local newspaper is an information product in an unstable state. Its traditional functions are being invaded by others and its markets are under challenge. This paper surveys technological developments that may affect the local distribution of information and examines trends favoring and impeding the local newspaper.

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

Looking beyond polarized arguments over competition versus monopoly in the communications arena, this paper notes the massive and fundamental social and technological changes that have occurred since the Communications Act of 1934. Given the strategic importance, economic and military, of communications, the paper argues that examining the current validity of the FCC's mission as set forth in the Act should be the first order of public business. Specific agenda items address "What are the ends and who says so?" and "What are the means?"

Berman, Paul J. and Oettinger, Anthony G. *The Medium and the Telephone: The Politics of Information Resources*. 170 pages. June 1976. Available only through Ballinger Publishing Co., Cambridge, Mass., in *High and Low Politics: Information Resources for the 80s*, 1977.

This paper traces the politics, economics and technologies of telecommunications pricing and costing policies using the distribution of news to newspapers and broadcasters as an example. Among the factors considered are divided federal/state jurisdiction, renewed competition, rate-setting mechanisms and technological change. Players are identified as are their stakes and the issues and policy questions they face. 49 charts and tables.

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

The paper deals with an important legislative technique: generating alternatives to accommodate conflicting positions. Four types of compromise are suggested for generating compromises systematically rather than haphazardly. Many examples drawn from the author's Congressional staff experience are presented and the building blocks of

Figure 13.

**REACHING VARIED PUBLICS —
THROUGH DIVERSE PUBLICATIONS**

High and Low Politics: Information Resources for the 80s

Anthony G. Oettinger
Paul J. Berman
William H. Reed

Constraints on the Regulatory Process

**A Case Study of Regulation
of Cable Television**

a theory of legislative compromise are discussed briefly.

Argyris, Chris. *Organizational Learning and Effective Management Information Systems: A Prospectus for Research*. 47 pages. May 1976.

The research program described here is part of a long-range inquiry into the nature of organizational learning. The purpose is to increase effective organizational performance. Within the general framework of Argyris's studies, the specific functions of Management Information Systems (MIS) in organizational learning will be explored in depth.

Imrie, Gordon. *The U.S. Mail Network: Who Pays, Who Plays*. 148 pages. April 1976.

The United States Postal Service (USPS) is one of the largest information networks in the world, handling some 90 billion pieces of mail annually. Imrie draws on the R-74-1 proceedings before the Postal Rate Commission, a major rate increase procedure, to provide an introduction to USPS statistics, the major players, the legal stakes, and the operation of the ratemaking machinery.

Capron, William M. *Comments on Telecommunications Policy Developments*. 12 pages. March 1976.

Rapid technical change in telecommunications has left public policy in chaos. Capron urges a careful approach by all those developing policy in this field. He warns that "quick fixes" may spread the chaos and close off potentially valuable policy options. Capron concentrates particularly on the hard choices to be made between competition and regulation.

Read, William H. *Foreign Policy: The High and Low Politics of Telecommunications*. 62 pages. February 1975. Available only through Ballinger Publishing Co., Cambridge, Mass., in *High and Low Politics: Information Resources for the 80s*, 1977.

International telecommunications has grown rapidly and is useful both as a unique window on global interdependence and as an instrument of the policies that shape interdependence. Read finds that one source of problems with traditional telecommunications policy-making is that it concentrates on carriers providing end-to-end service and excludes or ignores the many important transnational users, such as multinational corporations, private affinity groups, and military commands. These users operate their own international service

networks using leased facilities. Telecommunications is integral to their operations and not used simply as a point-to-point message service.

Karlin, Arlene. *Glossary of Costing and Ratemaking Terms in the U.S. Postal Service and the American Telephone and Telegraph Company*. 32 pages. January 1976.

This working paper is a "glossary of rates-peak", a first step towards distilling an understanding of costing and pricing issues from several murky broths. It is not simply a list of definitions from the financial accounting literatures, but a glossary drawing on the actual usage by the interested parties.

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

This report evaluates the many reform proposals marking the forty-year history of the Federal Communications Commission, and also suggests others, based on an alternative to traditional approaches to the study of organizations. This report addresses those interested in the processes of making policies as well as those interested in reforming the FCC.

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

This study of twenty-two state laws dealing with Electronic Fund Transfer (EFT) systems focuses on the definitions of EFT systems in the laws, on provisions for sharing, for interstate operations, and for operations by non-financial institutions, and with the sketchy "consumer protection" machinery provided.

Clippinger, John H. *Who Gains by Communications Development? Studies of Information Technologies in Developing Countries*. 120 pages. January 1976.

Third World countries have voiced great expectations for telecommunications development to foster formal and informal education, rural development, health care, national integration, vocational training, urban and regional development, technology transfer and urbanization. Much attention has been given to the potential benefits of these developments, but little attention has been paid to how the benefits

have been distributed or realized in practice. Clippinger aims to identify factors affecting benefit distribution and suggest options for deploying communications technologies for developmental ends.

Oettinger, Anthony G. *Elements of Information Resources Policy: Library and Other Information Services*. 217 pages. January 1976.

This is a report to the National Commission on Libraries and Information Science. Oettinger 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 display background information.

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

A narrative section reports on regulation efforts in various kinds of information systems, within and outside the government, such as crime information, medical, credit, and so forth. There is an extensive classified bibliography covering the same areas.

Kalba, Kas. *City Meets the Cable: A Case Study in Technological Innovation and Community Decision-Making*. 291 pages. September 1975.

This is a case study on the Cable TV decision process in Cincinnati. Results are compared with those in other large cities. Several prescriptive approaches to cable development — deregulation, franchising, public planning — are evaluated and compared 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 pages. August 1975.

This report, adapted from Mosco's doctoral dissertation, covers FCC decision-making on four

broadcasting innovations — FM, UHF, cable TV, and subscription TV. In effect, the FCC treated each innovation as ancillary to the dominant commercial broadcasting system of the time, e.g., FM was treated as a variant of AM broadcasting, UHF as a variant of VHF.

Berner, Richard. *Constraints on the Regulatory Process: A Case Study of Regulation of Cable Television*. 143 pages. August 1975. Available only through Ballinger Publishing Co., Cambridge, Mass., 1976.

This paper describes in detail how industry groups altered the FCC's choice of cable regulations, and how the Commission's Cable Bureau differs from the FCC as a whole on these issues.

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

This paper traces the history of FCC assertions of jurisdiction over CATV. Berman concludes that answers to the jurisdictional question are as elusive as they were when they were first addressed by the FCC and the courts in 1960.

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

A non-technical essay describing the "information explosion" and the concomitant growth of communications systems leading to the formation of new kinds of industries. Reprinted from the 1975 *Britannica Book of the Year*.

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

Science-fiction claims and "blue-sky" promises oversold the CATV industry and tied it up in red tape. Branscomb makes a realistic assessment of the process and discusses the issues for public policy.

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

This two-volume compilation is a general guide for research in the field of information resources policy.

Volume 1. *Annotated Reference Guide*. 76 pages. Includes annotated lists of general reference guides and statistical sources, an annotated bibliography of books, reports, and court cases in information policy, and a listing of material in the Program library.

Volume 2. *Legislative Guide*. 94 pages. A self-programming guide to federal legislation, executive documents, and federal agencies and departments. It also includes special reprint material on gathering documentation in broadcasting.

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

An outline of a 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 pages. January 1975.

This paper discusses the importance of the production, distribution, and consumption of technological goods and services, and how these matters might be better examined by scholars.

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

Phister compares the functional and cost performance of the two major forms of spreading computer technology.

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

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

Oettinger, Anthony G. *Merging Media and the First Amendment*. 6 pages. 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 pages. Fall 1974. Available only through Ballinger Publishing Co., Cambridge, Mass., in *High and Low Politics: Information Resources for the 80s*, 1977.

New services offer combinations of computation and communications facilities, but old legal doctrines demand strict distinctions between the two. Berman examines the FCC's responses to this dilemma and its impact on the concept of communications common carriage.

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

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

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

An examination of the importance of transportation and communications in locating corporate headquarters.

Lavey, Warren G. *Towards a Quantification of the Information/Communications Industries*. 120 pages. May 1974.

A first, rough census of the information industries. Preliminary attempts at comparison are made.

ORDER LIST FOR PROGRAM PUBLICATIONS

Annual Report 1976-77. 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 four Program annual reports available on request as long as supplies last.)	\$23.40
Read, William H. <i>Communications Policy: An Agenda</i>	\$10.90
Read, William H. <i>Coming: A Law of Communications Conference.</i>	\$10.90
Loeb, Guy Hamilton. <i>The Communications Act Policy Toward Competition: The Sound of One Hand Clapping</i>	\$10.90
Beyer, Lawrence, Hispman, Irwin, and Weinhaus, Carol. <i>Information Industries: Patterns of Activities, Regulation, and Sales</i>	\$10.90
Sichter, James W. <i>Separations Procedures in the Telephone Industry: The Historical Origins of a Public Policy.</i>	\$23.40
Prives, Daniel. <i>E.F.T. Policy and Competitive Equality: The Roles of Courts and Congress.</i>	\$23.40
LeGates, John C., and Oettinger, Anthony G. <i>Prospectus for the Expansion of the Program on Information Resources Policy.</i>	\$10.90
Benda, Charles G. <i>Postal Policy: Issues, Interests and Options.</i>	\$10.90
LeGates, John C., Oettinger, Anthony G., Read, William H. and Weinhaus, Carol L. <i>Foreign Policy Choices for the 1970's and 1980's - Information Resources, Strategic Strengths-Strategic Weaknesses.</i>	\$23.40
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
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
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
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
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
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 Communications Industries.</i>	\$23.40

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
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 following publications are available only through Ballinger Publishing Co., Cambridge, Massachusetts:

Berner, Richard. *Constraints on the Regulatory Process: A Case Study of Cable Television*. 1976.

Oettinger, Anthony G., Berman, Paul J., and Read, William H. *High and Low Politics: Information Resources for the 80s*. 1977.

7

REVIEWERS 1976-77

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.

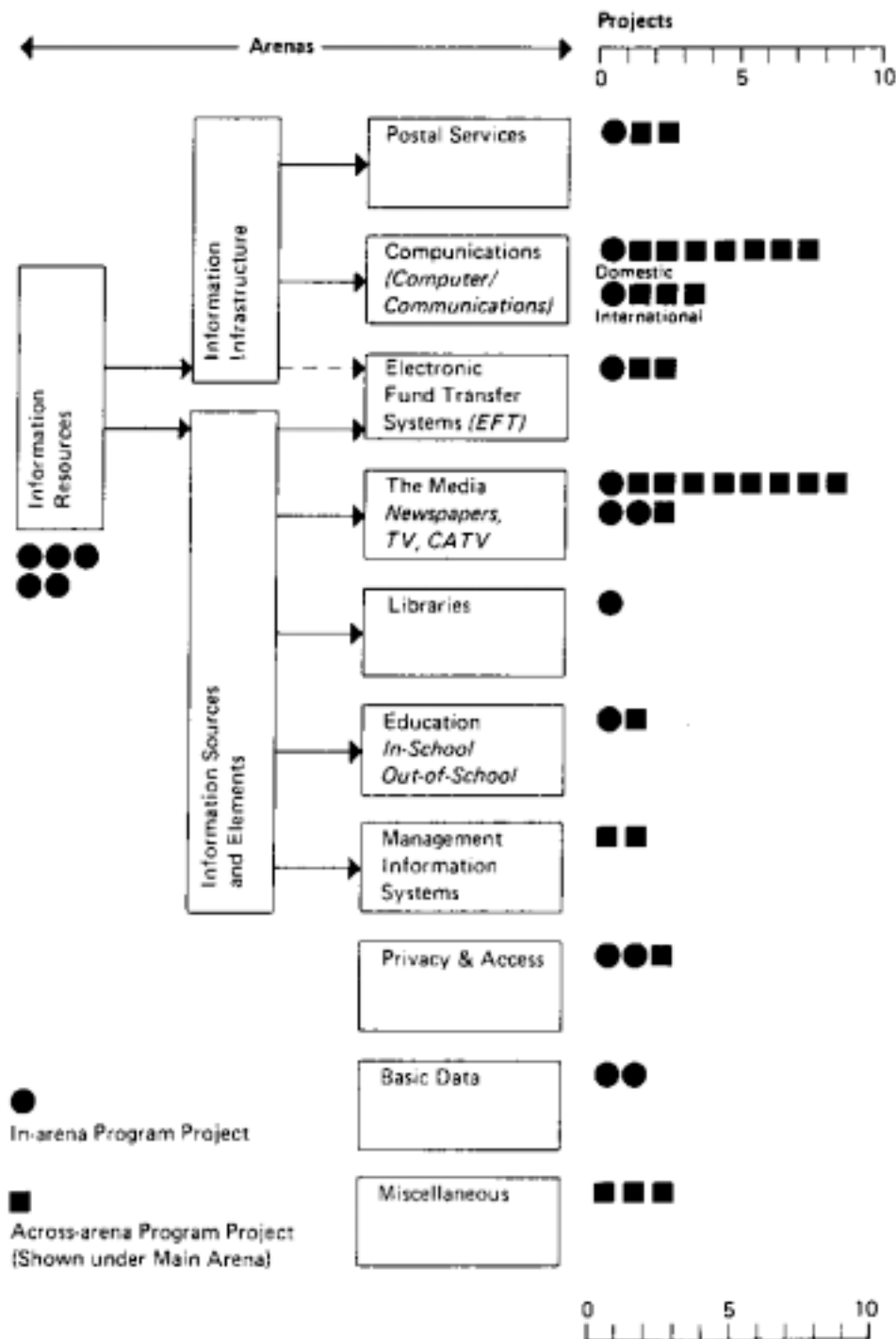
Sidney Aronson
Paul Berman
Geoffrey Blodgett
Stephen Botein
Joseph Burke
Abram Chayes
Chapin Cutler
William Ditch
George Dixon
Wallace Doud
Robert Earl
Tom Ellington
William Fishman
David Flaherty
David Forney
Jerry Friedheim
Neil Friedman
Richard Gabel
Wreatham Gathright
Gerald Gay
Dean Gillette
Neal Gilliatt
Douglas Ginsburg
Byron Grayson
Werner Hartenberger

Dale Hatfield
Howard Hawkins
Christopher Heller
James Heskett
Winston Himsworth
Morton Horowitz
Charles Joyce
Stanley Kapner
Ann Kerwick
Robert LaBlanc
Dan Lacy
Harold Levy
Donald Malone
William Malone
Mary Jo Manning
Herbert Marks
Archie McGill
Richard McKenna
Newton Minow
John Morgan
Harry Nicol
Thomas Nientimp
Barney Oldfield
Nell Painter
Tom Parmenter

Jules Perlberg
Dan Piccone
Richard Priest
Francis Reintjes
John Richardson
Paul Rodgers
Richard Rosenbloom
Eugene Rostow
John Rothman
Peter Salisbury
William Schabacher
Otto Silha
Michael Slomin
Robert Smith
Peter Stanley
Steven Star
Stanley Stillman
Jules Tewlow
John Tracey
Arthur Traub
Christopher Vizas
Alvin von Auw
Edward Weppier
Alan Westin

Figure 14.

THE PROGRAM HAS CONDUCTED STUDIES IN THESE ARENAS:



THE STUDIES DEAL WITH . . .

... THESE PLAYERS ...

Percent of Projects

0 50 100

Markets

Users

Providers

Labor and Capital

Government Agencies

Scope

State/Local

Federal

International

Function

Legislative

Executive

Regulatory

Judicial



... AND THESE STAKES ...

Power

Human Rights

Industry Performance and Structure

Costs and Prices



... USING THESE TOOLS.

Economics

Finance and Management Science

History

Law

Science and Engineering

Sociology and Political Science

0 50 100



CHAIRMAN

Anthony G. Oettinger, Chairman 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 was a consultant to the Executive Office of the President of the United States through the National Security Council from 1975 to 1977 and the Office of Science and Technology from 1961 to 1973.

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.

From 1966 to 1968 he was president of the Association for Computing Machinery. He is a member of the Council on Foreign Relations and 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. His most recent book, with Paul Berman and William Read, is *High and Low Politics: Information Resources for the 80s*, published by Ballinger Publishing Co. 1977.

DIRECTOR

John C. LeGates is Director of the Program, and Lecturer in Information Resources Policy. His experience prior to joining the Program has been in the business community, developing and managing computer and communications systems.

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 mar-

keting 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).

EXECUTIVE DIRECTOR/Postal and Allied Arenas

John F. McLaughlin is the Executive Director for Postal and Allied Arenas. He spent sixteen years with the Federal government, first with the Federal Aviation Agency's Research and Development Service and then more than twelve years at the Headquarters of the Post Office Department and the Postal Service. During his last four years with USPS, he

was the Director of Strategic Planning. In that role, he also headed the task force that prepared the USPS Staff Study, *Necessity for Change*, and he was the principal author of that report.

He has a bachelor's degree in history from Princeton University and studied at M.I.T. as a Presidential Fellow in Systems Analysis.

POLICY COMMITTEE 1976-1977

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

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

Chairman, 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

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

Director, Program on Information

Resources Policy

Lecturer in Information Resources Policy

Paul C. Martin

Faculty of Arts and Science

Professor of Physics and Dean,
Division of Engineering and Applied
Physics

John R. Meyer

School of Business Administration

1907 Professor in Transportation, Logistics and Dis-
tribution

Arthur R. Miller

Law School

Professor of Law

Joseph S. Nye**

Faculty of Public Administration

Professor of Government

Anthony G. Oettinger

Chairman, Program on Information

Resources Policy

Professor of Applied Mathematics and of
Information Resources Policy

Raymond Vernon

School of Business Administration

Herbert F. Johnson Professor of
International Business
Management

EXECUTIVE COMMITTEE 1976-1977

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 Public
Policy

*Resigned May 10, 1977; currently on a two-year sab-
batical in Europe.

**Resigned January 31, 1977; currently Deputy to the
Under Secretary of State and for Security Assistance,
Science and Technology.

CORE PROGRAM STAFF

Anthony G. Oettinger
Chairman

John C. LeGates
Director

John F. McLaughlin
Executive Director/Postal and
Allied Arenas

Claire M. Bishop
Administrative Assistant

Carol L. Weinhaus
Research Assistant and Librarian

Larry Beyer
Research Assistant

Irwin Hipsman
Research Assistant

Laura Brody
Assistant Librarian

Sylvia Cashton
Secretary

Margaret Helfrick
Secretary

Girard Hackert
Recorder

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 and Devices, Inc.
Cambridge, Massachusetts.