

# Citizen Utilization of Networking Technology

## A National Environment Information System

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### ABSTRACT

The effectiveness of citizen participation in complex decision making can be enhanced by citizen access to modern computer systems. Such systems, referred to as networking technologies, allow for the rapid, simultaneous, interactive manipulation and storage of large numbers of inputs and outputs from and to diverse sources. Citizen groups and public interest organizations are currently involved in a variety of activities whose effectiveness could be increased by participation in a shared national environment information system. Some specific uses of the system, problems of development, and next steps are discussed.

Citizen effectiveness in environmental decision making depends upon their degree of participation in setting the options at the time of structuring the decision.<sup>1,2,3</sup> Until recently only agency officials, politicians, and industrialists had primary access to the information systems required to provide the basic inputs in shaping the decision to be posed.<sup>4,5</sup> With the increased availability at low cost of new networking technologies such as computers, cable television, micropublishing, etc., citizen groups will be able to amplify their current network effectiveness and thus their stake in the decision-making process.

## Networking Technologies

In the communications industry those technologies which allow for the rapid, simultaneous, interactive manipulation and storage of large numbers of inputs and outputs from and to diverse sources will be referred to as *networking technologies*.<sup>6</sup> Current applications of such technologies are to be found primarily in the areas of military surveillance and economic accounting with a few uses in social fields, e.g., manpower data banks, where jobs are matched with applicants, computer dating services, and grocery shopping. However, application of networking technologies to the solution of environmental problems remains undeveloped to date.<sup>7</sup>

This paper discusses how greater communication among diverse groups in the environmental field might be achieved through the development of an independent information computer network. Such a project would be broad enough to relate to groups concerned with population, ecology, conservation, consumer protection, environment, and national priorities. The network would make use of an established computer information retrieval system which can provide for participation by a number of users whose special interests, activities, and skills would contribute to the solution of environmental problems.<sup>8</sup>

### Basic Goals

Citizen groups and public advocacy organizations currently are engaged in a wide range of activities which include:

1. Monitoring the performance of government agencies and industrial firms.<sup>9</sup>
2. Organizing citizen action at the local, regional, and national levels.<sup>10</sup>
3. Setting precedents through the initiation of citizen suits and other legal actions against environmental polluters, and drafting model legislation and regulations.<sup>11</sup>
4. Conducting educational campaigns and research projects.<sup>12</sup>
5. Participating in public hearings regarding aspects of environmental decisions and impacts of new technologies on the environment.<sup>13</sup>
6. Making news or amplifying in the news the concern for the environment through demonstrations, public protests, and informal pressure and influence.<sup>14</sup>
7. Determining and influencing environmental policy through research and lobbying activities directed toward all levels of government.<sup>15</sup>

A wide range of overlapping information needs can be met if such groups participate in the development of a shared data base consisting of stored lists and information files. Unlike existing governmental and industrial informa-

tion programs which are made by and tailored for governmental and industrial use,<sup>4</sup> this information system would serve the interests of the participating citizen and public interest groups because they would be actively involved in its creation. This does not mean that government and industry sources would not be used, nor would they be restricted from participation.<sup>16</sup> Control of the system, however, would remain with the citizen groups. Organizations representing the different substantive, geographical, and functional aspects of the environmental field would be solicited to contribute their diverse information resources to the network.

The system would be structured so as to provide a range of user options to fit both the information needs and pocketbooks of participants. Systematic and standardized inputting of data would make environmental solutions and problems rapidly available as they arise, thus giving the needed rapid feedback to citizen groups for them to use in solving their own environmental problems. A range of information retrieval systems would be available, from edgenotch cards, microfiche, and, ultimately, time-shared computer terminals.

The use of a national time-shared computer network would allow rapid access to the data base. All that an organization or information center would need to put in or take out information is a resident terminal and a willing user, as far as the general information pool is concerned. As an interim step the availability of collections of important materials, through micropublishing, will provide the base for a common source of information. Regarding private information, it is anticipated that lists, for example, of particular organizations can be entered on an exclusive basis so that only that particular organization can use its own list. Subject to permission, the list could be used otherwise but only for a permissible environmental purpose. This would not militate against the establishment, at the same time, of a National Environment List, to be used only under defined conditions, for environmental purposes.<sup>17</sup>

### **How the System Might be Used**

A number of groups using the system from remote locations across the country, for example, could work together to assemble materials and compare ideas to draft comprehensive environmental regulatory material.<sup>18</sup>

The system could be used as an alerting news service for environmental problems that arise, or to report the status of environmental programs.<sup>19</sup>

A specialized audience data bank, the National Environment List, could provide on a readily furnishable basis, under proper safeguards, names and addresses of groups for selective dissemination of information as the need for collective action arose.<sup>20</sup>

Users could assemble and maintain an environmental filing reference system for terms, problems, common goals, and resources to be shared by groups and organizations.<sup>21,22</sup>

Comparative research or action projects could be established in a number of different locations utilizing the resources of scientists, students, and citizen activists.<sup>23</sup>

A national network based on such use of computer facilities is entirely feasible. Local efforts would provide service locally which would benefit from the comparative resources of national data and, in turn, provide useful information for the broader effort.

### **Advantages and Disadvantages**

The major advantages of such a time-shared computer system are:

- (a) rapid access to relevant information
- (b) flexibility in terms of editing and updating
- (c) ability of a number of users from different parts of the country to feed in and get back needed information
- (d) the data base would be cumulative; the participants would be consciously connected in a process of "making it"

The major disadvantages are:

- (a) cost
- (b) getting groups to agree on joint participation
- (c) developing standards to insure quality input

### **Past Experience**

The program briefly outlined above, and to be detailed below, grew out of the independent thinking and efforts of a number of persons and groups currently working on environmental problems. For the past several years a number of environmental and citizen groups have been working in regional programs to bring diverse citizen groups together on a local, regional, and broader basis to discuss common problems and concerns of conservation, ecology, and the environment. This has been done through the informal exchange of information between groups, occasional meetings, and convened conferences. The success of these informal activities has contributed to the rapid growth of correspondence lists, greater communication between groups, and better coordination of joint action in the environmental field. A number of organizations have developed action-research projects, organized student action groups, and established on-going information networks. Still other organizations have developed to organize and create technology for socially oriented and useful projects.

One example of such efforts is the Environment Information Services Project which has emerged out of a combination of these related interests mentioned above. In the past year the project has:<sup>24</sup>

1. Automated the list of local, regional, and national citizen environmental action groups. This is designed to locate groups according to geographical area, substantive interest, and special function.
2. Established the Environment Files Project—designed to provide a cross-referenced index of terms and categories useful to individuals and groups active in the environment movement, and eventually to serve as a data bank of environmental materials on a readily usable basis.

Special service programs have been developed for these pilot projects using the Meta Information Retrieval Systems currently in operation on Applied Logic's National Time-Sharing Network.

### **Meta Information Retrieval System**

MIRS is an operational national time-shared information retrieval system. The system was developed by Meta Information Applications, a computer software group which provides computer expertise to social-movement groups and organizations.

MIRS is analogous to the information retrieval system used by libraries, in which the books, listed in a master card catalog, are numbered and assigned one or more concise "descriptors," such as title, author, and subject(s). Cards in a library catalog are arranged alphabetically by descriptor name so that the user may look up any descriptor and find the catalog numbers of all books to which it applies. Since several descriptors may apply to a single volume, looking up any of these will produce a list of books containing the volume sought.

Many users may simultaneously interrogate a MIRS catalog or data base even while updating is in progress. Unlike other programs, whose data bases are updated periodically in batch mode, MIRS permits total interactive usage and updating at any time without adverse effects upon the MIRS system.

The MIRS "card catalog" system is clearly a powerful tool. With it the user may cross-reference and compile a list of data items which satisfy an arbitrary complex set of criteria.

### **Problems in the Development of a Cooperative Project**

One of the basic contradictions that has always plagued the successful operation of social movements has been, on the one hand, the desire of individual groups to preserve their autonomy through the maintenance of

their unique identity, the quasi-secrecy of their membership, and their dependency upon contributions for support. On the other hand, there has been the necessity to form coalitions and associations in order to gain the power inherent in joint effort.<sup>25</sup>

Coalition formation in the absence of networking technologies is a long and arduous task of intelligence gathering, trust building, etc. Before the introduction of inexpensive computerized mailing and offset printing only the wealthiest and most prestigious organizations could sustain a prolonged and successful campaign. However, as these new networking technologies found wider applications more and more groups and organizations availed themselves of the advantages which were once the sole province of the larger national groups.

This is not to say that national groups did not accelerate their efforts; and perhaps dissipate them as well, as indicated by the common low response to mass mailings caused by the proliferation of exchanged lists. (Many donors are perhaps familiar with the enclosed apology for duplicating appeals.) What appears to be evolving are new forms of organization which are adapting to the unanticipated consequences of networking technologies.

1. There is greater specialization of function between organizations and within groups; members are more dependent upon higher levels of expertise among active membership. Examples were enumerated in the beginning of this paper.
2. There is greater regional and local decentralization especially regarding mobilization around issues.
3. National and regional projects are initiated and carried out on an *ad hoc* coalition basis.
4. There has been the rapid growth of clearinghouses or centers whose major functions revolve around information dissemination and establishment of channels between groups.

These trends have yet to succumb to the forces of centralization which tend to dissipate energies at the grass-roots level. What is at stake is whether environmental groups at the national leadership levels have the capacity for building applications of networking technologies which will sustain this grass-roots enthusiasm.

For better or worse new networking technologies are on the horizon and will be used. It is appropriate now to consider some of the essential ingredients for the creation of a national information network which would best serve the needs of groups at the local level.

To bring together a number of participating groups that would actively cooperate in forming a shared data base:

1. There must be the financial support from a number of sources whose concerns are directed toward citizen participation.
2. Participation must represent a broad base of citizen groups, research institutes, facilities, and technical groups.
3. The project should advance incrementally with built-in assurances that the integrity and standards of the system are maintained.
4. Existing national coordinating bodies should support the project through their active participation.

Initiators can assume that no one group can effectively create or effectively handle such a project. The growth of the project must remain flexible and open to all organizations that may benefit, on a decentralized basis.

Several steps have already been taken toward bringing groups together to work on cooperative projects, including:

1. Surveys of the information needs and resources of existing groups in the environmental field. Lists of such groups exist already or are in the process of being assembled by a number of organizations. The compilation and integration of such lists are an important part of the organizing process of establishing the network.
2. The examination of resolutions and declarations of policy at conferences and meetings over the past year, and the review of current environmental issues appearing in the literature and files of active citizen groups.
3. Establishment of informal working committees and panels on a regional and functional basis whose major concern is research and information processing for the environment movement.

It is hoped that the process of establishing the information needs and resources of the environment movement will provide a working incentive for groups which are currently moving in this direction to come together on a cooperative basis.

### **A Formal Program**

Three types of groups should be sought as initiating participants:

1. *Information Input Groups*

Both newly-established and older-established groups whose primary focus is research, analysis, information gathering, and dissemination should be located and encouraged to participate in the structuring, sharing, and inputting of data into the data base. The project should encourage the establishment of inter-organizational working committees on such topics

as standards, user needs, inventories, etc. These groups may be special arms of current action groups, associations, or independent organizations. To avoid potential conflict over proprietary rights, etc., it should first be made clear that the information network is a cooperative and mutually beneficial endeavor. The early phases should emphasize the establishment of mutual trust, cost, and resource sharing. It is important that resources be made available to groups to experiment and implement the innovations they may mutually devise. It can also be pointed out that participation in such a network experiment is an attractive incentive for recruiting new talent into an older organization. The exact selection of such groups cannot be determined in advance and would of necessity emerge through self-selection, group selection, geographical, and user selection.

### 2. *Technical Groups*

The careful selection of groups and organizations whose special expertise can contribute to the management and implementation of the technical aspects of the project would be sought and evaluated. Given the nature of the environmental cause, such groups must be evaluated by their social as well as economic and organizational dimensions. For example, we would seek assistance from public broadcasting and local network groups rather than large commercial broadcasting organizations. In addition, we would seek assistance from nonprofit institutions and corporations (rather than profit corporations) and even smaller profit corporations whose record had proven to be in the public interest.

### 3. *The User Group*

The success of the information network depends upon the support and participation of a broad-based, grass-roots movement. The network must serve the local needs of such groups. It can do this by providing the mechanisms for multi-channeled communication between local groups. The major focus of the project will be to demonstrate the ways in which networking technology can more effectively serve those groups and individuals whose efforts have been directly focused on bringing together diverse interests concerned with the environment, and to encourage intelligent and effective citizen action for the environment.

## REFERENCES

1. James D. Carroll, "Participatory Technology," *Science*, 171, 547-653, Feb. 19, 1971.
2. Frank M. Potter, Jr., "Pollution and the Public," *The Center Magazine*, May, 1970.
3. Hazel Henderson, "Computers: Hardware of Democracy," *Forum* 70, pp. 22-51.
4. Richard A. Carpenter, "Information for Decisions in Environmental Policy," *Science*, 168, 1316-1322.



5. Edward M. Arnett, "Computer-Based Chemical Information Services" *Science*, 170, No. 3965, 1370-1376, December 25, 1970.
6. Social scientists are just beginning to turn their attention to the growth of new technologies. For a theoretical overview of the growth process of new technologies see: Camilla Auger, *A Developmental Approach to the Study of New Technologies*, Bureau of Applied Social Research, Columbia University.
7. See: Directory of Environmental Pollution Information and Data Programs. Ad Hoc Committee for the Study of Environmental Quality Information Programs (SEQUIP) in the Federal Government. Office of Science and Technology, Executive Office of the President, July, 1970.

There are a number of existing as well as proposed information services which utilize computer technologies. However, few of these programs call for the interactive networking of users into a shared data base, although most call for information retrieval capabilities of some sort.

Most uses of new networking technologies have been used in old-fashioned ways, and potential applications of future networking technology show a similar lack of imagination. Some communications specialists conceive of them as new reasons for the consolidation of power, e.g., feedback to the government through cable TV or greater social control through matching of dossiers from diverse data banks. What has been overlooked is their potential for social change. The more interesting applications seem to be emerging in movement type organizations and activist circles where interpersonal networking performs a crucial function and networking technologies are logical extensions of existing forms.

8. Ronald G. Havelock, *Planning for Innovation*, Institute for Social Research, The University of Michigan, Ann Arbor, Michigan, 1969.  
Presents a comprehensive review and synthesis of studies of the utilization and dissemination of scientific knowledge. Most studies place the consumer at the tail end of the innovation process. Whether citizen applications of new networking technologies will reverse this trend remains to be seen.
9. Philip M. Boffrey, "Nader and the Scientists: A Call for Responsibility," *Science*, 171, No. 3971, 549-551, Feb. 12, 1971. See also, as examples, the work of The Council on Economic Priorities, based in Washington and New York.
10. Earth Day was organized in 1970 by Environmental Action, Inc., a Washington based national mobilization group. This year several organizations, including the Conservation Foundation, Environment!, Friends of the Earth, The Population Institute, Sierra Club, The Wilderness Society, and Zero Population Growth have joined with Environmental Action to proclaim Earth Week. This year's theme will emphasize decentralized local action.

Other groups plan the establishment of regional "Advocacy" centers and still other groups have formed networks of association, not to mention the numerous coalitions formed around specific issues. The problem still remains, however, of devising a system which would provide accurate, up-to-date information to citizen groups at the local level in time for the information to be useful and effective.

11. Groups involved in litigation include, for example, the Sierra Club, The Environmental Defense Fund, the Citizens' Committee for the Hudson Valley, and the newly formed Natural Resources Defense Council. The drafting of the Environmental Bill of Rights legislation in New York State involved major citizen effort.
12. Scientists' Institute for Public Information, The League of Women Voters, and the Junior League all have major research and information-dissemination programs related to environmental problems.
13. See, for example, the work of the Environmental Planning Lobby in New York, or

- at the national level, the result of the First Congress on Optimum Population and Environment (to be published by McGraw-Hill), or the work of the Environmental Defense Fund.
14. A good example is Environment!—an action group which mobilized a public demonstration against the opening of the Automobile Show in New York City in March, 1970.
  15. For example, the activities of The League of Conservation Voters or Friends of the Earth.
  16. The Public Broadcasting Environment Center, for example, has an ambitious proposed program of dissemination of environmental information and education; cooperation with such a public agency would be essential for citizen group effectiveness.
  17. Such a list is currently being prepared by Environmental Resources, Inc.
  18. For example, the group might examine the resources of the World Environmental Legal Data Bank and Research Center and, hopefully, utilize them in such a project.
  19. A proposal growing out of the recent workshop on Information and Public Opinion at the recent Congress on Optimum Population and Environment.
  20. The United Nations is currently preparing a world Target Audience Data Bank Service. See: Center for Economic and Social Information: CESI/PC. 69-13, 8 December 1969.
  21. Several groups have developed indexing systems for environmental materials, e.g., Scientists Institute for Public Information, Northwestern Students for a Better Environment, Ecology Forum, and the Environment Information Services Project.
  22. Everett M. Hafner, John M. Fowler, and Curtis A. Williams, *Environmental Education 1970*, Scientists' Institute for Public Information Workbook.
  23. See National Science Foundation's Program to Support Student Initiated Research on the Environment.
  24. A number of individuals and organizations have formally supported the early phases of the Information Services Project; they include: Environment! The Natural Area Council, The Kaplan Fund, and the Conservation Foundation.
  25. See, for example, Eugene Litwak and Lydia F. Hylton *Interorganizational Analysis: A hypothesis on Co-ordinating Agencies*, in Amitai Etzioni, *A Sociological Reader on Complex Organizations*, Second Edition, Holt, Rinehart and Winston, 1969.