NGO Networking: The Telematic Way

Carlos A. Afonso

This text is partly based on the author's speech at the INTERDOC Preparatory Workshop (Epe, the Netherlands, September, 1989).

Networking, in various forms, has become an international goal of the non-governmental organizations' (NGOs) world. The main objective is to exchange reliable information quickly and efficiently in order to attain common objectives, and to learn from each other in the process as well. While the contents of NGO networking vary widely, the forms are converging recently to an increasingly extensive use of telematic means. These means, in their turn, are advancing rapidly to provide worldwide multi-media services which tend to unify digital and analogic information through common carriers in such a way that video, audio, phone and data services would be available in the same wires that today carry only analog voice phone services. ISDN (integrated services digital networks) are operating in Asia, Europe and North America, and portable analog videophones which can connect to each other via a direct call to a satellite channel are commercially available for less than US$250.

Democratizing telematics

The gigantic leaps in digital technology during the 1970's and 1980's have resulted in an accelerated democratization of telematic power, as the home computer of the late 1970's has become a powerful data processor and communicator, thus bringing mainframe power of the mid-1970's to the hands of the family or university student in the Northern hemisphere, and the small organization worldwide, at home appliances' cost.

Besides an accelerated development of data carrier networks, telematic technology has also benefitted from revolutionary advances in signal processing devices and software. This leap has meant the possibility of connecting two microcomputers through long-distance calls (using standard voice phone lines), using high-speed error- correcting modems capable of data compression, to exchange data at speeds of hundreds of characters per second thousands of kilometers apart from each other, and automatically discarding (transparently to each end of the connection) errors due to line noise.

Regular communication being done between Rio de Janeiro and San Francisco in this way, for example, averages nearly 500 characters per second. At the phone connection cost of less than a U.S. dollar per minute, this means that more than ten text pages (3,575 characters per page) can be exchanged per U.S. dollar between Brazil and the U.S.. The total equipment and software cost (both ends) to permit this exchange is less than US$5,000.

These communication costs could be further reduced (and probably the data transfer rate increased significantly) by connecting the two microcomputers

through direct calls (with special modems and 2-meter transceivers) to non-profit satellite channels such as PeaceSat and others.

This is the new world of means of communication which thousands of NGOs worldwide are discovering, learning and practicing. A democratization of means on an international level unthinkable just five years ago.

Outreach: NGO networking

Several initiatives by NGOs for taking advantage of the new techniques have started during the 1980's. The first significant one took place in 1984, at the initiative of the late Charles Foubert and the Italian NGO IDOC-- the formation of an international NGO network called Interdoc. About a year later, most Interdoc participants started using Geonet, a private European data communications service, to exchange data with microcomputers. Physically, this network became a sort of "star network", in which users link their microcomputers, via phone lines and data communication carriers, to a minicomputer centralizing all data exchange among these groups. The center of this "star" is what is called a node.

Another form of interconnection-- the remote bulletin board system (RBBS)-- has been in use by thousands of groups worldwide since the CP/M-80 operating system (and cheaper floppy disk drives) became widely available (circa 1980). Hundreds of CP/M-based microcomputers, connected to voice phone lines, began to offer electronic mailbox ("e- mail") and bulletin board services, mostly on a non-profit basis. Groups have been using these systems to exchange messages and programs, and to organize specialized information services on themes such as environment, AIDS, minorities' rights, small systems development, and so on. Naturally, the advent of the more powerful IBM PC systems stimulated migration of these bulletin boards to what would become the "de facto" standard of the microcomputer market-- the IBM PC- compatible PC/MS-DOS systems. In the meantime, RBBS operators contributed to the development of methods to interconnect individual e-mail systems. Another "de facto" standard emerged-- the Fidonet system, proposed by Tom Jennings. Today, networks of RBBS systems sprawn across the globe, and links to larger systems are being experimented or in full operation.

At about the same time, groups in England and the U.S. also began to develop methods and facilities to organize communications networks using more powerful microcomputers. Borrowing on the philosophy of the RBBS networks, these groups began to implement a large-scale e-mail and conferencing system oriented to serve the NGO community on a non- profit basis. In 1984, peace movements joined forces to foster the development of this network, and in 1985 an experimental system called PeaceNet I started its operations in California. In 1986, PeaceNet I was upgraded to a much more sophisticated service (based on the Unix operating system) called PeaceNet II. Another network, focused on environmental concerns, EcoNet, was organized in 1982, under the coordination of the Farallones Institute in California. In 1987, Farallones transferred EcoNet

to the Institute for Global Communications-- a new NGO created to manage PeaceNet.

Meanwhile, European peace and environmental movements created GreenNet. Originally operated through the Geonet system, they installed their own node in 1987. In 1988, a regular link between GreenNet and IGC was established.

The EcoNet-PeaceNet-GreenNet undertaking shares a common objective: to build professional network facilities by developing their own communications services, or nodes, to be used by thousands of individuals and organizations, at minimum costs. Major differences between this system and the RBBS network are the scale of operation (each node is currently capable of handling thousands of subscribers and requires higher level technicians), advanced connectivity (derived from the embedded data transfer facilities of Unix), and easier access: each node is connected to international data communication carriers and provides high-speed modem lines to allow highly efficient access through long-distance phone calls.

On the other hand, the system shares an important characteristic of smaller RBBS networks-- modularity. Additional, automatically interconnected nodes can be installed as local needs arise, and the capacity of each node can also be expanded as technology advances and demand for services increases. Since all nodes share the same basic hardware (high-end microcomputers based on the 80386 microprocessor), operating system and communications software, maintenance and developing can be a joint undertaking, further improving the efficiency of the network.

IBASE: a short story

The Brazilian Institute of Social and Economic Analyses (IBASE) was founded in 1981 by a group of political scientists, sociologists, economists, computer experts and others, with international experience in other countries of Latin America, Europe, the U.S. and Canada. This international dimension is an important element to explain not only IBASE's conception but also the proposed methodology, objectives and practice of the institute.

IBASE is a non-profit consultancy and research non-governmental organization (NGO). It is not linked to any political party and has no religious affiliations. IBASE provides studies, consultancy, data processing, data communications and other services to rural and urban workers' unions, community organizations, popular education and documentation centers, other consultancy groups, students and others. Based in Rio but working with groups and other NGOs throughout Brazil and from abroad, IBASE's teams total nearly 100 people-- including researchers, helpers, students on assistantships, administrators, and volunteers.

As a consultancy center and facilitator, IBASE receives several requests from those groups, usually related to one or more of the following themes, issues or activities:

- specific studies on the social, political and economic situation of areas in which the groups are active;
- studies to support alternative proposals to official policies;
- production and circulation of audiovisual and printed materials for training and popular education;
- data communications and data processing services;
- surveys;
- support to seminars and workshops.

The basic goal of IBASE's work is to contribute to the attainment of social justice, solidarity, sustainable social and economic development, and a participatory democracy. The main objective of the institute to achieve this goal is to facilitate the democratization of reliable social, economic and political information to civil society, as well as to contribute in providing adequate and effective means for this democratization.

Until 1988, IBASE's activities resulted mostly in regular publications, books, newsletters, radio programs, audiovisual kits, articles and studies in newspapers, magazines and other periodicals.

However, since its foundation, IBASE has been closely following up the telematic revolution. In Brazil, IBASE has been the first NGO to use microcomputers both for its internal administrative and research needs and as a tool in support of other groups' activities. From a single 8-bit CP/M-80 machine in 1981, to a local area network (LAN) of more than 25 16-bit MS-DOS computers in 1989, the institute's data processing facilities provide services such as: databases, desktop publishing, statistical analysis and data processing of surveys, computer consultancy and services to other groups and NGOs, etc. In addition, since 1985 IBASE has been experimenting with remote exchange of data between microcomputers. Since that year, IBASE has been a member of Interdoc.

IBASE and the APC network

The PeaceNet-EcoNet-GreenNet initiative evolved into a proposal to create an international association to foster the development of non- profit computer networks, under the name of Associaton for Progressive Communication (APC). The goals of APC generally coincide with the ones of IBASE: struggle for social justice and respect for human rights, concern for the environment, and fostering sustainable development and participatory democracy. The association shares its resources (technical expertise, software) among participants, while each node is fully autonomous to pursue its objectives within the general aims of APC.

In 1988, IBASE agreed to join the APC Network. A project for setting up a node in Brazil was submitted to the United Nations Development Program (UNDP). It was formally approved in December of that year, with financial support from

UNDP, IBASE, and from the Italian government through CESVI (Cooperation and Development), an Italian NGO based in Bergamo and dedicated to supporting community development projects worldwide. Among the factors that contributed to IBASE's decision to participate were:

- the close coincidence of aims and objectives of the APC initiative and IBASE's; - the specific interest of IBASE in contributing to developing alternative means of information exchange;
- the possibility of providing a service not only to Brazilian but also to other Latin American groups at costs much cheaper than using commercial services;
- the relatively advanced data communications system available in Brazil;
- the proven expertise of IBASE in working with microcomputers.

The AlterNex Network Node

To further develop its expertise in data communications, in 1988 IBASE installed an X.25 port to Brazil's packet switching system (RENPAC). Through a technical agreement with the Brazilian Interdisciplinary AIDS Association (ABIA), IBASE designed a remote access database system on AIDS. It allowed any user to obtain information on hospitals, treatment methods, prevention, etc, by connecting a microcomputer to the RENPAC system via a local telephone call from most of the larger Brazilian cities, and also from other countries.

In March, 1989, IBASE started to operate an RBBS system based on Tim Stryker's MajorBBS software-- it was rewritten to work with the X.25 port. At the same time, IBASE's technicians, with advice from IGC experts, started to assemble an 80386 machine to run Unix-- the operating system of the APC network.

These experiments were extremely important for evaluating the consequences of proposing to maintain a round-the-clock, reliable communications service by a non-profit NGO. This involved a significant operational reorganization and infrastructural improvements (such as uninterruptible power supply, systematic back-up of users' transactions, efficient on-line maintenance procedures, hiring of higher level computer experts, and so on).

On July 18th, 1989, the AlterNex Node started to operate its full e-mail and conferencing services from the Unix machine, automatically interconnected to the other nodes of the APC network.

In the meantime, similar nodes were being installed in Australia (Pegasus), Canada (The Web), Nicaragua (Nicarao), and Sweden (FredsNaetet). At the time of this writing, all these nodes are also fully operational, thus constituting a worldwide seven-node non-profit network now interconnecting more than 5,000 users.

The following list indicates the current numbers of users in each node of the APC network (as of February, 19, 1990):

```
IGC............. 3,661
GreenNet........   668
The Web.........   505
Pegasus.........   348
AlterNex........   159
FredsNaetet.....   117
Nicarao.........   105
Total........... 5,563
```

Through gateways to Internet, Bitnet, Geonet, and to commercial services such as DASNet, this user base can reach dozens of thousands of organizations and individuals in most countries.

Since August, 1989, a direct phone line allows users to connect to AlterNex without having to go through the packet switching system. This is especially useful for users of the Rio de Janeiro area (where hundreds of NGOs are located). This line is capable of MNP error correction, and IBASE supplies communications programs to emulate error correction with standard modems, so users are able to connect without noise-induced errors even with long-distance calls, using cheap 1200 baud modems. These facilities are currently available in all nodes of the APC network.

The APC network currently provides e-mail and conferencing services. Automatic interconnection means that a user in any node can exchange messages with users of any other node, and also participate in more than 60 networked conferences on themes such as external debt, tropical forests, Central America, environment, health, and others. Networked database systems are being tested and should be implemented during 1990.

Perspectives of the network

Although a great deal of the programming for the system is already developed, the network demands the availability of Unix programmers in each node-- both for maintenance and joint technological development. In the case of IBASE, for example, technicians are working on a system which will allow the DOS-based LAN to share the X.25 port with the Unix machine-- thus allowing services such as remote access databases to be run from standard MS-DOS computers, and permitting local users to access the node from any computer in the LAN. Once this software is fully debugged, it will be available to other nodes. Thys system could allow, for example, the simultaneous operation of a Fido system through the same X.25 port, stimulating interconnection to Fidonet.

There is also the need for an operator and a secretary to handle administrative tasks such as accounting, user registration and billing, etc. Other running costs include leasing of communication and phone lines, preparation of newsletters,

manuals, mailing, etc. The current estimate of running costs for the AlterNex Node is nearly US$6,500/month. Since its official opening, the node has seen its user list grow to nearly 160 groups and individuals by February, 1990. Current projections indicate a total of nearly 450 paying users by mid-1990 (thus permitting self-sufficient operation), although participation by Brazilian NGOs has not yet caught up as much as initially expected. The main reasons for this are:

- lack of understanding of the potential of the network;
- difficulty to assimilate the new technology involved;
- lack of resources to purchase microcomputers and phone lines (a phone line in Brazil must be purchased, at costs at times higher than US$2,000).

As to the first two reasons, we believe the animation campaign being carried out by IBASE and other NGOs is overcoming these limitations. The last one is hard to solve-- most of the more than 3,000 Brazilian NGOs are very small, running mostly on voluntary work. As an alternative to this economic difficulty, IBASE is proposing with several other larger NGOs the setting up of "community e-mail agencies"-- rooms equipped with a microcomputer and printer, connectable to AlterNex, and permanently open to smaller community groups.

Our estimates are that these "agencies" could be implemented in two months in at least 25 of the largest Brazilian cities, handling an average of 25 users each. Many human rights and environmental organizations could benefit from these "agencies". IBASE is presently seeking financial support to help in setting up the basic hardware and phone lines for this project (estimated at about US$6,000 per "agency", including the phone line). IBASE already maintains its "agency", with data communications, telefax and telex services available to groups in Rio de Janeiro on a non-profit basis.

Another project proposes a revolving loan fund managed by a group of well-known NGOs to provide financial means for smaller groups to install the basic equipment to connect.

An interesting development is the growing number of users from other Latin American countries (Chile, Peru, Uruguai, Ecuador, Argentina, Colombia), as well as users from Italy, West Germany and Japan. Another important development is UNDP's interest in continuing to support the expansion of this network in Latin America. A regional project to study ways to expand the network is being carried out by UNDP, in consultation with IGC, IBASE and CRIES (the NGO in Nicaragua which operates the Nicarao node).

Finally, a project to start a new APC node in Moscow-- which would allow Eastern European groups and individuals to participate in the network-- is being implemented, with probable starting date for full operations in May, 1990.

Carlos Alberto Afonso, co-founder and present executive coordinator of IBASE, studied naval engineering in Sao Paulo, and holds an M.A. in Economics from York University (Canada), where he also undertook doctoral studies in Social and Political Thought. He has been involved with microcomputer applications since the end of the 1970's.
