INTERNATIONAL
TRANSNATIONAL
ASSOCIATIONS

10

ASSOCIATIONS
TRANSNATIONALES
INTERNATIONALES

1977

TRANSNATIONAL ASSOCIATIONS
ASSOCIATIONS TRANSNATIONALES

The 29th year of our periodical begins with a bold change to a new title « Transnational Associations » in harmony with the diminishing relevance of the old one « International Associations ».

The transnational nature of nonprofit associations demands recognition and our informed readers will not be surprised that we want to give a good example of conceptual clarity.

The purpose of * Transnational Associations » is to present significant contributions to understanding about the structure and functioning of the complex network of international organizations. The main concern is to focus attention on the roles and problems of the wide variety of transnational associations (NGOs : international nongovernmental, nonprofit organizations) in the international community. In this sense « Transnational Associations » is the periodical of transnational associations and those interested in them. It therefore includes news, studies, statistics, activity and meeting information, as well as articles. The articles range from descriptions of individual organizations to academic investigation of groups of organizations and their problems. The focus of the selected articles is less on the substantive world problems on which they may act (which are extensively examined in other periodicals) and more on the present methods of international action and future alternatives which can usefully be envisaged and discussed. Related themes regularly treated are : relationship of NGOs to intergovernmental organizations, techniques of meeting organization, international information systems, multinational enterprises.

The readership therefore includes : international association executives, intergovernmental organization executives, scholars of the sociologe of international action, organizers of international meetings, commercial organizations offering services to international bodies, and others interested in the activities of the whole range of international organizations.

* Transnational Associations » is the organ of the nonprofit Union of International Associations, although the views expressed are not necessarily those of the UIA.

Cette 29eme année de notre Revue apporte un nouveau titre « Associations Transnationales » au lieu d' « Associations Internationales ».

Le fait transnational des associations non lucratives (OING) le veut ainsi et nos lecteurs ne seront pas surpris que nous donnions le bon exemple d'un langage clair.

La raison principale d'« Associations Transnationales » est d'apporter sa contribution à la vie et au développement du réseau complexe des associations, dans ses structures comme dans son fonctionnement.

Le premier souci d' « Associations Transnationales » est de fixer l'attention sur les tâches et les problèmes d'un large éventail d'associations transnationales sans but lucratif — les organisations dites non-gouvernementales dans la terminologie des Nations Unies. En ce sens « Associations Transnationales » est la tribune des associations transnationales et de tous ceux qui s'y intéressent. Cette revue mensuelle contient des nouvelles, des études, des statistiques, des informations spécifiques sur les activités des associations, leurs congrès, leurs réunions. Aussi des articles, des chroniques ayant trait aux problèmes et aux intérêts communs aux associations.

Le sujet des articles choisis s'attache surtout à la méthode de l'organisation internationale considérée notamment dans ses rapports avec le secteur privé des associations et dans la perspective des adaptations nécessaires aux temps nouveaux, plutôt qu'au fond des problèmes, qui sont le propre de chaque groupement et traités ailleurs dans des revues générales ou spécialisées.

Nos thèmes habituels sont les relations des ONG avec les organisations intergouvernementales, les techniques de l'organisation internationale, les systèmes d'information internationale, outre les entreprises multinationales.

« Associations Transnationales » est l'organe de l'UAI, association sans but lucratif, bien que les opinions qu'il exprime ne soient pas nécessairement celles de cet Institut.

TRANSNATIONAL ASSOCIATIONS : 29th year, 1977

The subscription rate is: BF 850, FF 110, FS 65, US $ 24.00 per year (10 issues) + postage.

Method of payement :
Bruxelles: Compte-chèque postal n° 000-0034699-70 ou Compte n° 210-0451651-71 à la Société Générale de Banque, 48 rue de Namur, 1000 Bruxelles.
London : Crossed cheque to Union of International Associations, 17, Anson Road, London N7 ORB.

ASSOCIATIONS TRANSNATIONALES : 29e année, I977

Le prix de l'abonnement est de: FB 850, FF 110, FS 65, $ 24.00 par an (10 numéros) + Frais de port.

Mode **de** paiement à utiliser :
Genève : Compte courant n° 472.043.30 Q à l'Union des Banques Suisses.

Paris : Par virement compte n° 545150-42 au Crédit du Nord, Boulevard Haussmann, 6-8 (C.C.P. de la Banque n° 170,09).

TRANSNATIONAL ASSOCIATIONS
ASSOCIATIONS TRANSNATIONALES

(former title : INTERNATIONAL ASSOCIATIONS) (ancien titre : ASSOCIATIONS INTERNATIONALES)

29th year 1977 - n° 10 29e année

octobre
October

(Note : The second part of the debate « organisational systems versus network organisation . will be published in Transnational Associations, N° 11 and not in this issue as announced.)

Photo de couverture : Institut Belge d'Information et de Documentation. Jean Fyt — « Nature morte aux fruits -.
Cover Photo : Belgian Institute of Information and Documentation, Jan Fyt — « Still Life with Fruit ..

Published MONTHLY by
Union of international Associations (founded 1910)

Editorial and Administration: Rue aux Laines 1. 1000 Brussels (Belgium)
Tel. (02) 511.83.96.
UK Representation (including advertising) : 17 Anson Road, London N7 ORB Tel. (01) 609 2677

Advertising : Roger Ranson. Advertising Manager. 9. av. de Lattre de Tassigny, 92210 St. Cloud France. Tél. 602.5383.

International Associations, rue aux Laines 1, Bruxelles 1000 Belgium Tél. (02) 511.63.96 — 512.54.42.

BENELUX Media 4, av. du Pois do Senteur. 33
B-1020 Brussels, Belgium, Tel. (02) 268.04.18

MENSUEL publié par
Union des Associations Internationales - UAI (fondee en 1910)

Editeur responsable : R Fenaux 1. rue aux Laines, 1000 Bruxelles (Belgique). Tél. (02) 511.03.96.

de Tassigny. 92210 St. Cloud, France. Tél. 602.5383.

Associations Internationales, rue aux Laines 1. Bruxelles 1000 Belgique
Tél. (02) 511.83.96 — 512,54.42.
BENELUX : Média 4. av. du Pois de Senteur 33
B-1020 Bruxelles. Tel (02) 268 04 18

ENHANCING TRANSNATIONAL NETWORK ACTION

In recent issues of Transnational Associations reports have been published on « complexity » as a constraint on social innovation. Those articles showed how the complexity of world problems was not matched and contained by an appropriate network of concepts, information systems and organizations. And, perhaps even more seriously, it was pointed out that our antiquated approach to organizing meetings seems to obstruct any efforts to focus effectively on complex issues without dangerously over-simplifying them, alienating potential collaborators, or inhibiting our ability to act.

The same issues of Transnational Associations have also contained articles on the emerging use of organizational networks and their significance as a response to our complex rapidly evolving social environment. However, as with conventional organizations, the activities of such networks are, for the most part, currently governed by the communication costs, rates and delays associated with document production, the intercontinental postal service and occasional use of the telephone and telex.

in this issue of Transnational Associations, we have gathered together a number of articles to explain how a new and little known technique — computer conferencing — is likely in the immediate future to change radically the way that people can meet and work through national and international groups. It is a technique which provides direct support to organizational networking — possibly of as yet unforeseen kinds — and without necessarily requiring and reinforcing some of the antiquated structural features which we seem to be currently obliged to build into our organizations for legal, administrative, political or prestige purposes.

It cannot be stressed too strongly that those familiar with this technique consider it to be a breakthrough in person-to-person communication of as much social significance as was the telephone. This is best illustrated by the fact that it can facilitate (possibly anonymous) contact between people or groups on the basis of common interests or projects but without requiring prior knowledge of the identities of those who can usefully be contacted. (The table on p. 403 may help to explain how computer conferencing differs from more familiar forms of communication). Although the technique is relatively easy to describe, it is however quite difficult to understand the radical nature of its implications :

« Most of our intuitions about face-to-face interaction do not apply to this new and unusual form of communication. In computer conferencing, time and distance are dissolved... Each person's « memory > of what has been said is accurate and complete. And everyone may « speak » at once or * listen » at leisure. With such features... entirely new patterns of interaction emerge ».

(J. Vallee et al. The Computer Conference : an Altered State of Communication ? The Futurist, 9, 3 June 1975, pp. 116-121).

It should be stressed that such patterns can be significant in terms of clarifying action decisions between many bodies as is illustrated by the fact that the first computer conferencing system was developed for the U.S. Office of Emergency Preparedness. It should also be stressed that such patterns of interaction blur the distinctions between a meeting and an organization and the roles and activities normally associated with each. The need for the physical presence of people, files and records at a particular location may rarely be necessary. The internal rules governing any computerbased organizations may simply by-pass current legislative provisions and rigidities concerning « statutes ».

Those who doubt the future relevance of such a technique to their own activities should reflect on how the operations of their organizations are limited by dependence on telephone /post /travel, on how quickly low-cosl « pocket computers » have become common in office and home, on the sophisticated games that can now be plugged into a television set in the home or a café, and on the forecast that computer terminals will soon be as cheap as colour TV sets. Those who perceive the technique as irrelevant to their relations with developing countries should consider the current world-wide development in data networks and satellite communications and their own problems of communication with such countries.

A number of international associations have used the technique for their own programmes (see page 446) as has the Kettering Foundation which is investigating its use. Several articles included here report on the active support being given by the U.S. National Science Foundation to groups of scholars wanting to keep in computer-based liaison. Already groups of scholars concerned with specialized areas are making use of this technique as a substitute for their normal communications (and for the professional organization ?). Soon an individual will be faced with the question of whether he or she can afford not to link into the special interest network(s) of those with whom he or she normally interacts — where cost is a factor, for many the choice between a TV and a computer terminal will not be difficult, particularly since the latter is a guarantee of non-directive interaction rather than programmed passivity. Groups, associations and institutions will be faced with the same question — with the flexibility and ra-

pidity of computer conferencing contrasting as sharply with the uncertainities and rigidities of current postal and telephone communications as did the telephone with the messenger and pigeon post services in the past.

There appear to be three different . styles - of computer conferencing (aside from the distinctions made in the article by Jacques Vallée) : (a) Offering the conferees every conceivable automated means of conferring and interacting and using the computer to prevent them from being overwhelmed (This is the approach of the new E1ES system); (b) Restructuring the conference to include low-key computer communications and guiding the moderator with analytical feedback to facilitate-the exercise of any necessary leadership to ensure participation (This is the approach of the PLANET system); (c) Determining the basic concepts about which information will be exchanged during the conference and using participant computer input to refine the interrelationships between the concepts as a guide to determining with whom it would be most fruitful for each to interact (This is the « Conference Facilitation > approach). The articles printed here stress the importance of the technique for maintaining links between a relatively stable network of people dispersed over a large geographical area. Most of them neglect its potential impact on a large conference where people have difficulty in making significant contacts to benefit from the presence of unforeseen groupings of people who share a concern that none of them had necessarily expected to be expressed on that occasion. The technique can facilitate the emergence of such groupings or coalitions within a relatively unstable and rapidly changing network of people and issues, whether present at a conference or linked to it from distant locations. It offers considerable advantages as a means of facilitating communication in a multilingual environment (with no limit on the number of languages) since any message can be passed via the appropriate translator(s). And it is an ideal technique for facilitating the transformation from plenary session configurations into a multitude of small groups and back again — particularly when the number, concerns and room allocations of the small groups need to be flexibly determined up to the last minute, or when many such groups can usefully be conducted without need for face-to-face contact. (1)

There should be no illusions about the difficulties of obtaining the full benefit from this technique. One article (page 436) reports on the legislative and regulatory problems which will be created by the PTT administrations unfamiliar with or resistant to it. There are still political problems to be solved in the establishment of the European On-line information Network (EURONET) and the compromises made will not necessarily facilitate computer conferencing particularly in those countries which tend to inhibit person-to-person contact and group formation. Meanwhile multinational enterprises are rapidly expanding their own US-based data networks and services. We are about to witness a subtle battle between those offering access to data bases via networks, with all the political and economic implications of dependency incurred by acceptance of any one of them. There are problems of data base monopolies and data network cartels, information is power and undoubtedly many intelligence agencies will wish to monitor data links as an extension of their focus on telephone calls. It may even be that the full potential of this person-to-person technique will be made available only in some countries or only within specialized conference centres, think-tanks, or other elite institutions. The considerable advantage it gives to such places will rapidly become obvious. On the other hand, computer conferencing could really constitute the much needed major breakthrough in international and transnational action. It creates a unique « communication environnant » which facilitates all aspects of organization and meeting activity, whilst giving greater precision to whatever controls and structuring are felt by participants to be really necessary. An individual or group with many interests is freed to interact, virtually simultaneously, with many different networks, rather than being restricted by the need for attention to only one of them. It is the ideal technique to by-pass inter-group and intra-institutional communication blockages.

In a special sense computer conferencing gives form and structure (however subtle and dynamic), for the first time, to the Sixth Continent — the transnational, non-territerial world — over which so much activity takes place. We can but speculate on the individual and group energy which could be « unlocked . by the catalytic effect of such a communication environment. What would be the effect on a transnational association if all its members were so linked ? What would be the effect on an intergovernmental agency if all its secretariat offices and members were so linked ? What would be the effect on the network of NGOs in consultative status with IGOs if they were so linked ? What if « transnational centres » established in each city were so linked ? What is its significance for the organization of a transnational university in a multilingual, transdciplinary environment ?

It may well be that conventional organizations will be unable to respond ap propriately to this opportunity because of the perceived threat to their tradi tional structures. (One should lor example, evaluate carefully precisely what new kinds of exchanges, if any were permitted during the Unesco experiment in « tele-conferencing » reported on page 423). But new groups, and coalitions of transnational groups' may well take to this non-directive technique « like a duck takes to water » it is not difficult to foresee the possibility that alternative communities around the country (and across continents) will shortly link themselves through many such computer conferences into a rich and active network whose characteristics and potential are already beginning to emerge.

Already, for example, the London Festival for Mind and Body (100.000 participants) is investigating its use for 1978, and the Humanity Foundation is planning its use during a satellite link-up between simultaneous meetings in Los Angeles, Toronto and London of 3,500 persons each. If the value of the technique is satisfactorily demonstrated by such grass-roots initiatives, a new era in transnational communications will be launched and a further question mark may be placed over organizations and meetings as currently structured.

Whilst conventionally structured bodies will of course continue to exist (and may even permit themselves minimal use of this technique), we may witness widespread transnational interaction of people and groups through a multiplicity of computer « conferences » whose number, interconnected ness, and subject matter change constantly in a bewildering variety of configurations in rapid response to the issues and insights of the day. The majority of such conferences will have no need to make use of a conventionally structured organization base — they will have broken free of the territorial requirement. Whether such conferences are « organizations » or « meetings > or neither is an academic question — it is through them that the majority of transnational action is likely to occur in the future.

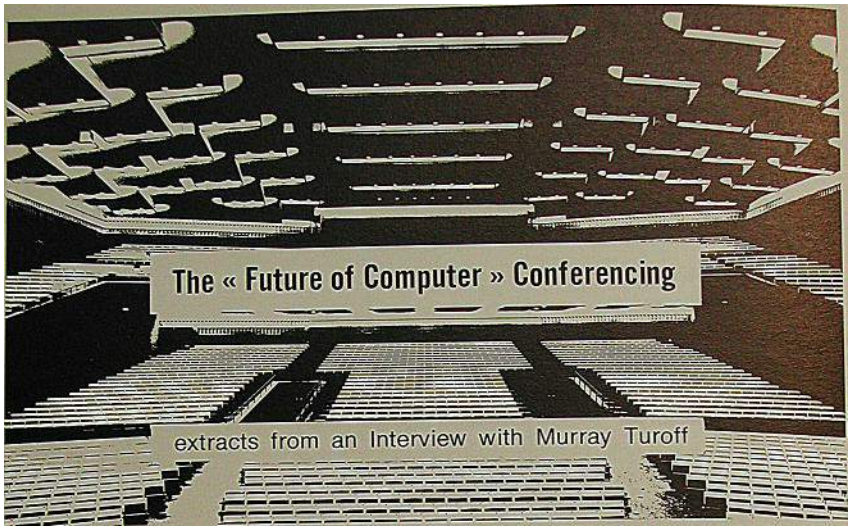
A.J.N. Judge

(1) For a feasibility study of this application see : A J N Judge, Computer conferencing as a means of enhancing communication at a large conference/ festival, Brussels, UIA, 1977, 20p.

Computer conferencing in context

KEY :
a = audio r = reception only
p = paper s = special /rare
v = videotape m = minimal
e = electronic i = indirect /via
x = used

	Permanent record	Addressed message filing	Conference Interaction	Text processing structuring	Notebook (private)	Bulletin (public message space)	Keyword associati	Survey assistance	Computation modelling simulation	Data bank and exchange of data	Assisted instruc-tion	Graph & diagram assis-tance
A. TELEPHONE-BASED												
1a One-way message (int'l)	a											
b « « (national)	a											
c « « on multi-room site	a											
d « « within conference room	a											
2a Normal 2-person call (int'l)	a											
b « « (national)	a				**« TELEPHONE CONFERENCE »**							
c « « on multi-room site	a											
	-											
3a Conference call (int'l)	a		m									
b « « (national)	a		m									
c « « on multi-room site	-		-									
d « « within conference room	-		-									
B. TELEX-BASED												
4a One-way message (int'l)	p											
b « « (national)	p											
c « « on multi-room site	-											
d « « within conference room	-											
5a Normal 2- party telex (int'l)	p											
b « « (national)	p											
c « « on multi-room site	-											
d « « within conference room	-											
6a Multi-party telex (int'l)	p		is									
b « « (national)	p		is									
c « « on multi-room site	-		-									
d « « within conference room	-		-									
C. RADIO-BASED												
7a One-way transmission (int'l)	**a**										**x**	
b « « (national)	a											
c « « on multi-room site	ar											
d « « within conference room	**ar**										**xr**	
8a Two-way transmissions (int'l)	a										**xs**	
b « « (national)	**a**										**X**	
c « « on multi-room site	as											
d « « within conference room	-										**—**	
9a Many-party contact (int'l)	**as**		**im**								**—**	
b « « (national)	**as**		**im**								**xs**	
c « « on multi-room site	**as**		-								**—**	
d « « within conference room	-		-								**—**	
D. TELEVISION-BASED												
10a One-way transmission (int'l)	v										**X**	
b « « (national)	v										**X**	
c « « on multi-room site	**vr**										**xr**	
d « « within conference room	**vr**										**xr**	
11a Two-way transmissions (int'l)	**vs**				**«TELE-CONFERENCING »**							
b « « (national)	vs											
c « « on multi-room site	**vs**											
d « « within conference room	-											
12a Multi-way transmissions (int'l)	**vs**		**ms**									
b « « (national)	**vs**		**ms**									
c « « on multi-room site	-		**ms**									
d « « with in conference room	-		-									
E. COMPUTER-BASED												
13a Question answer service (int'l)	**e**		**« ELECTRONIC MAIL »**				**m**		**m**		**xs**	
b « « (national)	**e**						**m**		**m**		**xs**	
c « « on multi-room site	es						m		m		-	
d « « within conference room	**es**						**ms**		**ms**		-	
14a Electronic message exchange (int'l)	**e**	**x**	**im**	**m**	**m**	**m**		**« COMPUTER CONFERENCING "**				
b « « (national)	**e**	x	im	m	m	m						
c « « on multi-room site	e	x	im	m	m	m						
d « « within conference room	**es**	**xs**	-	-	-	-						
15a Multi-way conference (int'l)	c	x	x	x	x	x	x	x	x	x	x	x
b « « (national)	c	x	x	x	x	x	x	x	x	x	x	x
c « « on multi-room site	**e**	x	x	x	x	x	x	x	x	x	x	x
d « « within conference room	es	xs	xs	xs	xs	xs	xs	xs	xs	xs	xs	xs
16a Simultaneous multi-way conferences (int'l)	c	x	x	x	x	x	x	x	x	x	**x**	x
b « « (national)	c	x	x	x	x	x	x	x	x	**x**	x	x
c « « on multi-room site	e	x	x	x	x	x	x	x	x	x	x	x
d « « within conference room	es	xs	xs	xs	xs	xs	xs	xs	xs	xs	xs	xs



These extracts from the complete interview are reproduced by kind permission of the World Future Society. The complete interview first appeared in their journal « The Futurist », August 1975.

Murray Turoff, the developer of the first computer conferencing system, predicted widespread use of computer conferencing by 1980, when computer terminals will cost about the same as a color TV costs today. Computer conferencing may benefit deaf and handicapped people, developing countries, doctors, housewives, and students. It may even help to ease sex, age, racial, and ethnic biases and to maintain world peace.

F: How would you describe computer conferencing and how do you think it differs from verbal communication ?

T : At its simplest level, computer conferencing is a written form of a conference telephone call. Using a computer terminal, a person can talk to a group of people by typing messages and reading, on a display screen or a printout, what the other people are saying. The computer automatically informs the group when someone joins or leaves the discussion. When a person signs off, the computer marks his location in the discussion and picks up at that point when he rejoins the conference. Computer conferencing differs from verbal communication in some very important ways. People engaged in computer conferencing can be both geographically and chronologically dispersed. In computer conferencing, everyone may « talk » or « listen » at the same time. A person can make his contribution to the discussion at his own convenience, rather than having to wait until other speakers have finished. He can work at his own pace, taking as much or as little time as he needs to read, contemplate, or reply. He can « leave » the conference at any time, knowing that the computer will store all of the messages that he has missed and show them to him whenever he is ready. Each message is assigned a number and labeled with author, date, and time for easy identification and retrieval. Computer conferencing is a truly self-activating form of communication.

The fact that input can be anonymous leads to more open and uninhibited discussions, particularly in the case of someone who would otherwise be hesitant to disagree with a superior. The results of votes are presented only as distributions and there is no way to determine who voted which way on any particular issue; in addition, a conferee can change his vote at any time. During the computer conference, individuals may « whisper » to one another by exchanging private messages which are not part of the permanent record of the conference; the other conferees are not even aware that these exchanges are taking place. This whispering capability, by making possible timely subgroup negotiations and discussions, can lead to more rapid resolution of important issues. The printout capability provides a permanent record of the proceedings and insures against someone being misquoted. It is possible to retrieve information without going through the entire text; you might want to see all messages containing key words or the input of a particular person.

Computer conferencing puts unique psychological pressure on a person whose messages tend to be verbose,

Photo : The Hamburg Congress Centre.

** Murray Turoff is Associate Professor, Computer Science Department, and Director of Center for Technology Assessment, New Jersey Institute of Technology, 323 High Street, Newark. New Jersey 07102, The foregoing interview was conducted by Hollis Vail and Jerry Richardson of the World Future Society.*

irrelevant, or filled with bureaucratic jargon he will soon notice that no one is paying any attention to his messages. In a face-to-face conference, people have to give an appearance of listening to the speaker, but there is no way you can force a guy to read your messages on his computer terminal. One other important point I should make is that computer conferencing is the most efficient way to handle large group discussions involving 25 or more people and should be considered any time more than five people are discussing a subject. A conference telephone call begins to get difficult with more than five people, and face-to-lace meetings encounter problems when more than 15 people are involved.

F: You have said that « the most profitable mundane application of computer conferencing is project management ». Just what did you mean by that ?

T: The most popular, widely implemented view of management today is that the organizational structure should be capable of dealing with the particular problem facing a corporation or agency. However, organizations are now faced with a multitude of complex, overlapping problems. Structures would need to be changed every six months and no work would get done. A better method is matrix management, which draws on individuals, wherever they are in the organization, who can best deal with a particular problem. Computer conferencing is an effective way to connect people who are geographically dispersed or who work in different departments in an organization. The anonymous input capability makes it easier to get all the options on the table, since there is then no fear of disagreeing with or upstaging superiors. Even without anonymity, the individuals communicating through such a system tend to develop a feeling of equality with the other group members; no one person dominates the group, as usually happens in committee meetings.

It's very difficult for more than live people to work on a project jointly and really understand what each other is doing. By the time you get to 10, 15, or 20 people, they can no longer interact on a two-by-two basis and really work as a group. With computer conferencing, you can have as many as 50 people working together on a project. Top and upper middle management executives in private or public business organizations also are swamped with the need for personal communications. I am willing to bet that they spend over 60 % of their time talking to people, mostly inefficiently and with a lot of travel involved; yet, they never feel that they have really talked enough with all the people they need to communicate with. Executives are also usually very quick to complain about the committee meetings they've had to sit through where people repeated things that they really didn't have to say because no one knew that they all agreed. Consequently, the organizational environment is likely to be the first major development area for computer conferencing.

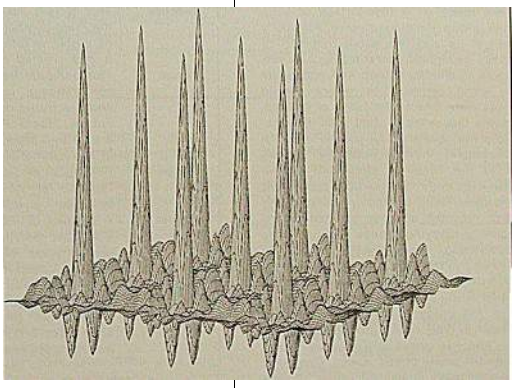
This ties in very neatly with the whole concept of transference of written material into electronic form and will contribute to the « paperless » office of the future. Over the next 5-10 years, that is a realizable goal, in terms of all internal forms of communication and organizational development. Computer conferencing is just one obvious way of making that office paperless. The main resistance to computer conferencing in organizations comes from the person whose job is dependent upon his control of inter-personal communications or information flows. If this is his only value, the conferencing system makes his role obsolete. Control is not meant to be confused with the « gatekeeper » concept of preventing information overload. In fact, the gatekeeper can utilize computerized conferencing to increase his effectiveness.

F : It's been suggested that computer conferencing be used to help the deaf and the physically handicapped. Could you explain how that would be done ?

T : There are some definite benefits in these areas. The deaf are limited in that they cannot use the telephone. Some deaf people have teletype machines, but that allows only one-to-one and not group communications. The number of people who can take part in a give-and-take discussion using sign language is also very limited; eye contact is required to find out who wants to talk next and that's a little hard for the group to coordinate.

Computer conferencing can also give handicapped people the opportunity to interact with non-handicapped people with similar interests in an atmosphere where no psychological bias exists because of the individual's particular handicap. There is no way to perceive a handicap through this form of communication. Some people fear that computer conferencing would increase the isolation of the handicapped, but I disagree. Computer conferencing, by increasing the number of contacts a person has. will eventually lead to more face-to-face contacts. It will also allow the deaf and handicapped to function more effectively in business organizations, particularly at higher management levels,

Varian Graphics



F : We have been talking mainly about business applications of computer conferencing. What will the computer terminal be used for in the home ?

T: I think it will be sold initially as an entertainment device. The whole area of computer games is very interesting. There are probably hundreds of games many of them extremely entertaining and challenging and having educational value.

Computer games become a lot more exciting when we introduce conferencing into them.

I really think the driving force in introducing computer conferencing into the home will be the teenagers and college students. The average teenager is not shy about these devices at all and will drag it into the home if he or she possibly can. Students could discuss projects, exchange information, and help one another with their homework, as well as talk about such things as teenage dating. Much of this will be a transference of what they now do over

the phone. A student could also receive home tutoring to augment what he gets in the public school.

F: What impact could computer conferencing have on local communities ?

T: The biggest impact will be the ability to find people interested in discussing a given topic, such as recipes or local sex practices. Anyone in the community could get on and declare a subject of interest and if no one joins him in two or three days it's wiped out; but if a group accumulates on a subject, the data remains in the system as long as people are interested in continuing the conference. A computer conference could link people who normally would never encounter one another. You can imagine discussions on drug problems during which people would feel free to reveal the direct experience they've had. because they can use a fake name. In a face-to-face community group meeting, they're not likely to get up and talk about that sort of thing. Computer conferencing can serve as an electronic town hall, especially in small communities where people have more direct knowledge of the problems they have to deal with. It equalizes the ability for all groups to make themselves heard. Hopefully it will have the effect of increasing citizen participation in the political process at the local level. Computer conferencing also provides an easy mechanism for forming lobbying groups without costly advertising. If you're interested in saving the tree down the street, you put in a discussion topic — removal of tree at 30 South Terrace — and people can join the group if they feel concerned about it. You could probably mobilize an effective group in a relatively short time on major public issues. Computer conferencing is likely to give citizens a much better feeling about their ability to influence local issues and to be important members of the local community.

F : Can you give us a specific example of how computer conferencing could affect local politics ?

T : Newark, New Jersey, for example, is a fascinating collection of interest groups, particularly ethnic (Cuban, Spanish, Puerto Rican, Italian, Black, etc.). Its complex social structure makes it a New York City in microcosm. Some of these groups are very cohesive, with well-known spokesmen who spend most of their time dealing with their own people and with the government. They hardly ever have the chance to interact with their counterparts in other groups. These key people could have a regular exchange of ideas by computer conference, increasing the chances of resolving problems before they develop into crises or polarizations.

Unfortunately, it is unlikely that anyone would be willing to fund this type of experiment. While it offers high potential rewards, it also carries the high risks associated with a political situation. If proven effective, this idea could be used throughout the country to bring together key peer groups in our society who don't have time to interact as a peer group because they are too busy dealing with the groups they represent. It would then be far less likely that an unscrupulous politician could play one group against another, since he would no longer be able to regulate and control the information flow.

F : Are there any major obstacles to the widespread use of computer conferencing ?

T: We continally come up against the fact that only one out of ten people who have computer conferencing explained to them really understands it. The fundamental problem is that it's a communication system that is really quite different psychologically from anything people are familiar with. As a result, people try to relate it directly to familiar things like the telephone and the postal system. But it is not really like anything we are familiar with, and the only way most people can appreciate the impact of computer conferencing is to experience ft. Otherwise a person assumes that what's easy for him is easy for the computer and what's hard for him is hard for the computer. Actually the opposite is usually true.

For instance, the computer can handle certain problems of parliamentary procedure better than people can. Disruption by dissenters would be much more difficult and the opportunity for conscious or unconscious bias by the chairman would be substantially removed. No one could bo interrupted while making a comment. In fact, a different form of parliamentary procedure specifically oriented to computers should probably be devised.

COMPUTER CONFERENCING SYSTEMS

Though computer conferencing is still in its infancy, a number of conferencing systems are already in use or being developed. Some of the most important ones are listed below :

Party line	*The simplest version of computer conferencing, it is the equivalent of a conference telephone call with a permanent written record of the conversation available; it was developed at the Office of Emergency Preparedness to deal with crisis management.*
Emisari	*A more sophisticated version of Party line, this system allows for asynchronous conferencing, the retrieval, editing, and rearranging of messages, and the inclusion of tables, bulletin board developed at the Office of Emergency Preparedness to deal with the wage-price freeze. The software for the conferencing system is now available at nominal cost from the National Technical Information Service. Department of Commerce, Springfield Virginia.*
Discuss	*This system, developed by adding the conferencing capability to the Plato computer-assisted instruction system, displays messages on a plasma tube and can retrieve text files and other stored data. It was created at the University of Illinois (Champaign-Urbana).*
Forum	*This computerized communication system can be used lor group conferencing, joint writing projects, planning and forecasting, and electronic notepads. It was developed at the Institute for the Future, Menlo Park, California. (For more information, see the article by Vallée, Johansen, and Spangler in the June 1975 issue of The Futurist.)*
Planet 1	*A simpler version of Forum, this system also originated at the Institute for the Future and is now available on the Tymshare computer network.*
Oracle	*A product of the Northwestern University School of Education's Computer Aids to Teaching Project, this* system combines *the conferencing capability with a computer-assisted instruction program called Hypertutor.*
Mailbox	*One of the first commercial applications of computer conferencing, this program was developed by Scientific Time Sharing Corporation, Bethesda, Maryland. The system links about SO employees and several hundred customers and is used for technical discussions and information exchange.*

The regulatory policies applied to computer conferencing could also be a serious obstacle. There is a danger now in some European countries that computer conferencing will be classified as a pure communication system. In a field in its early stage of development, with six different systems in existence now and hundreds of others possible, it would be very wrong to view computer conferencing in the same way as the telephone, in terms of having one standard system. It would freeze out many useful applications of computer conferencing. Computer conferencing systems are mostly software, while the telephone is mostly hardware. If computer conferencing is interpreted to fall under the Federal Communications Commission regulatory act, the long term development of many options would probably be seriously hampered in the United States. The overhead cost of seeking approval for a system will probably exclude a great deal of innovation.

F: You have suggested that computer conferencing can have tremendous benefits, both physically and psychologically, in developing countries. Can you explain how such a sophisticated technique could be applied in countries that lack advanced technology ?

T : One way would be to tie together 100 villages or small towns in a geographical region. This can be done at a reasonable cost if the villages already have a reasonably reliable telephone system and sufficient electric power to operate the equivalent of a few television sets at each location. One minicomputer costing one to two hundred thousand dollars and one terminal at each location costing one to two thousand dollars are needed. The cost per village would be only two to four thousand dollars, about the same as buying a small truck. By 1976, the cost may be only half what it is today. A village, instead of using phones in every hut, could have a - radioman » for the entire village who would be the link to other villages, marketing groups, and the national government. The capability for regional planning by computer conference could tremendously increase the feeling of regional cohesiveness among villages that previously felt somewhat isolated or independent. Specialists on subjects such as insect control, public health, and crop disease could use their time more efficiently by interacting with many villages at once by computer conference and then adjusting their travel schedules to meet immediate needs. Regional crop planning could also be done by computer conference. You could also have a • bid and barter » conference which would allow people to exchange, sell, buy, or rent items and would keep a record of the final agreements and arrangements made. Requests to the central government for information or aid could be entered through one conference where all the villages observe what is taking place. This would put psychological pressure on the government to be responsive in a timely manner and would give the villagers a feeling of being closer to the central government. The system could also be used for sending personal messages between individuals in different villages. Rather than trying to follow the path of the developed countries — a phone in every home — it would be far more feasible economically for developing countries to opt for computer conferencing instead.

F: What other capabilities does computer conferencing give us ?

T : We have very sophisticated techniques today for trying to discover the biases that influence a person's behavior in a group. You can imagine a conference made up of some very significant subgroups like labor and management and you can imagine the ability of the data processing in the computer to analyze certain inputs like the votes, the association of items, etc., all of which give you certain preference data. You can then imagine the computer programmed to inform a person when a particular phrase he is using is being interpreted differently by the group he belongs to than by the other subgroup that is taking part in the conference. This can facilitate communication between groups who have difficulty understanding each other.

F : What do you think is the long-range significance of computer conferencing for the future of mankind ?

T : The exciting thing about the computer is that it is the first major tool that man has invented which is an extension of his mental capabilities. The computer extends two dimensions of man's capabilities :(1) his memory, since it gives him the ability to remember things very accurately and (2) his ability to process data, to transform, condense, and review it. Computer conferencing takes a further step by

Computer Conferencing in the Future

Murray Turoff here lists some potential applications for computerized conference-systems .

• Legislators (all Democratic U.S. Senators, for example) hold a caucus *via computerized conference.*

• A family joins in a simulation of planning for the community as an evening's entertainment.

• A computerized conference is used for negotiations among labor and management people — with several anonymous arbitrators.

• Deaf people conference as easily as persons with normal hearing.

• Policy makers obtain quick response on the pros and cons of critical issues from consultants scattered around the country.

• Teenagers *maintain an anonymous conference on dating customs and problems.*

• Several physicians representing differing specialties maintain a computerized consulting and referral network.

• A housewife joins a conference discussion of current affairs.

• Students conduct and anonymous conference with their teachers to discuss various problems and subjects in their courses.

• A group of salesmen involved in marketing a line of technical equipment maintains a sontinuous conference for the purpose of comparing responses to customer questions and analyzing competitors' products.

• Home-bound handicapped people participate in educational courses,

• Topic-oriented « blind dating » conferences *help people of similar interests to find one another.*

New Tool

Factors Promoting Its Use :

1. Increased cost of travel.
2. Decreased cost of computer equipment and time.
3. Need to evaluate more complicated information.
4. Need to evolve more flexible problem-solving structures.

Factors Inhibiting Us Use :

1. Executives are not accustomed to using keyboard terminals.
2.. Persons who maintain their positions by limiting the flow of information (executive secretaries, for example) feel threatened by a free flow of information.
3. Fear of the « dehumanizing » nature of computers.
4. Persons near the top of hierarchical structures may fear a loss of power as structures become more fluid and adaptive.
5. Computer conferencing offers little or no direct ego reinforcement; ego-motivated individuals may tend not to excel in, or even accept, the anonymous framework.

Mitigating Influences :

1. Use of secretary to operate the keyboard.
2.. Development of voice-active models.

providing the individual with the creative cognitive capability of other people, a much wider range than he previously had available to him. You can then begin to talk about the concept of a collective intelligence and that is where you're making a tremendous extension. It may be possible to build a communication system which allows people to behave with an intelligence that might be at least in the upper five percentile of the group as a whole, if not better than the group as *a* whole. The Soviet newspaper Pravda recently sponsored an exercise in collective intelligence in which the public challenged a chess master. Each move was determined by majority vote and the public won once and tied once in two tries. The ultimate contest (or the computer scientist would be to have a collective human intelligence play chess with an artificial intelligence via computer conferencing.

F : Will computer conferencing be essential to the formation of a world government or worldwide cooperation in the distribution and for management of resources ? Could it help prevent war ?

T : Computer conferencing can bring about better international relations mainly by enabling countries to understand each other's statements, perceptions, goals, value systems, and socio-economic institutions. The extent to which we understand each other greatly influences our chances of reaching agreements and resolving conflicts peacefully. Major wars may be avoided if potential aggressors are able to recognize, through computer conferencing, the point at which their actions would be counterproductive. If a computer system with models and statistical routines built in had been functioning a few years ago, the African famine would probably have been recognized sooner and more effective plans for dealing with it could have been worked out on a international scale. Instead, there was an inability, in the initial stage of the famine, to admit to neighboring countries that there was a problem; hence, each country perceived it as a local problem and no cooperative steps were taken to alleviate the situation. What we must have is a more global view of what is going on between countries. If model-oriented computer conferencing proves effective, it could then be extended to the crucial matter of maintaining world peace. The major obstacles to computer conferencing in the international relations area are bureaucratic inertia and a subconscious mistrust of computers. If we can overcome those, computer conferencing can be a key element in the creation of a new era of peace, economic stability, and world cooperation for mankind.

When **to Use** Computer Conferencing

According to Murray Turoff, computer conferencing is particularly appropriate in the following five situations .

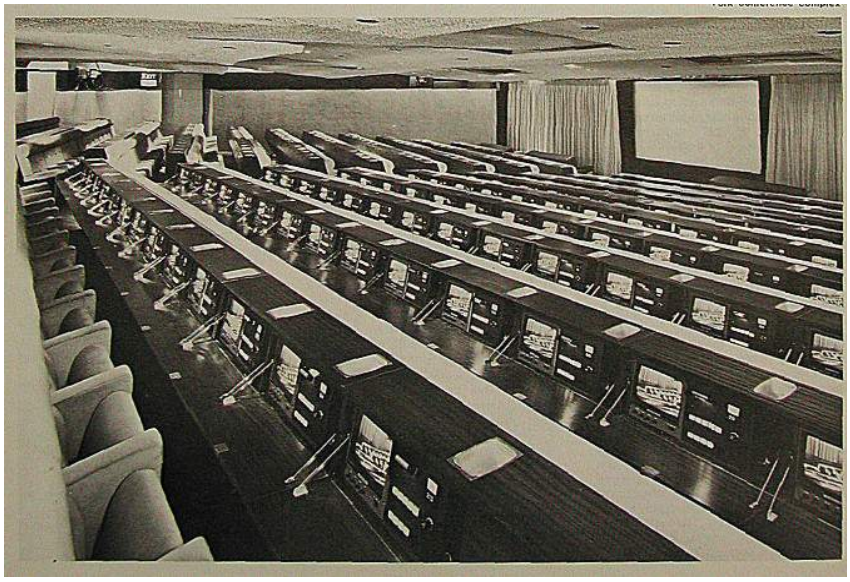
1. When the individuals needing to contribute knowledge to the examination of a complex problem have no history of adequate communication, and the communication process must be structured to insure understanding.

?.. When the problem is so broad that more individuals are needed than can interact *meaningfully in a face-to-face exchange.*

3. When disagreement are so severe that the communication process must be refereed.

4. When time is scarce and/ o r geographic distance are targe, inhibiting frequent group meetings.

5. When a supplemental group communication process is needed.



Les conférences par ordinateur : PLANET and FORUM

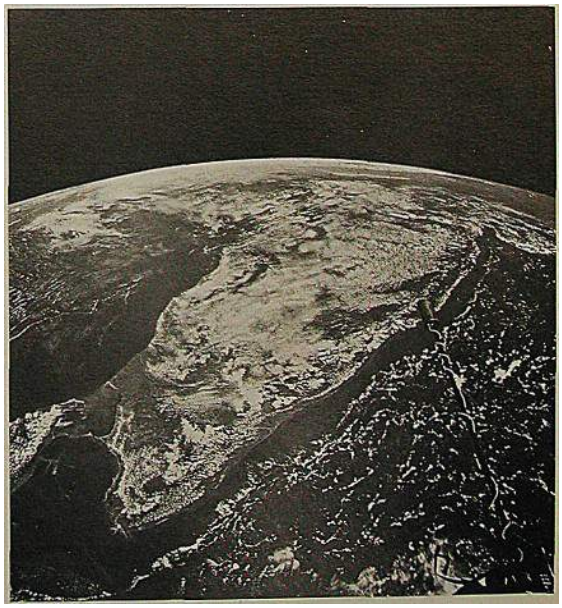
par Jacques Vallée*

C'est au début des années 60 que les premières études de communications par ordinateur furent faites aux Etats-Unis, mais il fallut attendre 1968 pour voir des applications démarrer dans des contextes gouvernementaux très étroits (échanges de messages entre offices régionaux dépendant du « bureau des Crises »). Des études systématiques dans le cadre de recherches combinant informatique et sociologie furent entreprises en 1972 par l'équipe que je dirigeais à l'Institut pour le Futur. Elles conduisirent à la réalisation du projet FORUM sur le réseau d'ordinateurs d'ARPA, puis au programme PLANET, plus élaboré, qui est maintenant accessible commercialement sur le réseau de la compagnie Tymshare. Aujourd'hui le stade des recherches de laboratoire est largement dépassé. On étudie l'optimisation des téléconférences sur mini-ordinateurs, et nous développons maintenant des programmes comme TOPICS et NOTEPAD pour ordinateurs Control. Data, qui peuvent travailler dans le cadre d'une gestion intégrée, mettant les participants en contact direct avec des modèles mathématiques et des bases de données.

Domaines d'application des téléconférences *(voir note page 411)*

Qu'est-ce qu'une téléconférence par ordinateur ? C'est la création d'un « espace » commun à un groupe de participants éloignés qui vont continuellement mettre à jour une série de textes sur des sujets variés, en réponse soit aux questions du modérateur ou du président, soit aux interventions d'autres membres du groupe. Si l'on s'arrêtait là, on aurait simplement une forme généralisée du « courrier électronique » tel qu'il existe depuis des années sur les principaux réseaux d'ordinateurs. Mais les téléconférences sont bien plus. Elles constituent, en fait, un nouveau « média ». Non seulement elles permettent l'échange d'opinions publiques, mais les discussions privées sont acceptées simultanément. L'interrogation directe de la « base de données » constituée par les intervention passées est possible à tout instant. Des sessions de « brainstorming » peuvent être organisées dans lesquelles six ou huit ou même plus de participants échangeront leurs idées en temps réel; les contraintes habituelles de la communication sont alors dépassées : on n'a pas besoin d'attendre que X ait fini de parler pour répondre à Y. Il arrive fréquemment que quatre ou cinq participants tapent leurs contributions au même moment. Pourtant le flot de la discussion demeure clair, pourvu que la conférence soit menée par une personne qui insistera sur un minimum de discipline. Cette nécessité suggère que les conférences par ordinateur, comme tous les autres média, sont limitées dans leurs applications. Au cours de nos recherches nous avons délimité très nettement cinq domaines d'application qui doivent être reconnus avant que les effets secondaires, et les conséquences pour l'entreprise, puissent être discutés. Ces domaines sont les suivants.

US National Aeronautics and Space Administration



** Président, INFOMEDIA Corporation. Formée en 1976, la compagnie Infomédia est la première entreprise spécialisée dans les conférences par ordinateur. Son siège est 430 Sherman Avenue, Palo Alto, CA 94306, USA. (En France, une filiaire des PTT, Intelcentre, propose un service de téléconférences * audiographiques *). Cet article est reproduit avec la permission de l'auteur de « Informatique et Gestion » no. 86. Une version plus détaillée a été publié en anglais sous le titre : The FORUM Project : network conferencing and ils future applications. Computer Networks (North Holland), 1,1976, pp 39-52.*

Les notes collectives

Il arrive fréquemment qu'au sein d'une organisation un groupe reçoive la responsabilité d'un projet à long terme, et que ce groupe soit géographique ment dispersé. Dans le domaine financier, les responsables des ventes pour les différentes régions forment un tel groupe. Dans la recherche, des géologues qui se trouvent sur le terrain doivent communiquer avec leurs collègues dans plusieurs centres; des éducateurs dans un certain nombre d'écoles voudront comparer leurs expériences avec de nouvelles techniques pédagogiques, etc. Ces situations sont toutes caractérisées par le même besoin : un petit groupe (10 à 30 personnes) veut rester en contact pendant plusieurs semaines ou plusieurs mois pour échanger des mesures, des chiffres ou des observations.

Les séminaires

Dans l'échange de notes tous les participants se connaissent déjà, et ils n'ont pas de limitation temporelle. Avec les séminaires au contraire, les membres du groupe viennent de disciplines ou d'organisations diverses, et ils doivent atteindre un résultat concret (écrire un rapport ou prendre une décision) dans un temps déterminé, typiquement une quinzaine de jours. Les échanges sont plus rapides et la discussion est très concentrée. Elle doit être menée par un modérateur qui organise l'agenda et maintient le dynamisme de la discussion pour que les participants ne perdent pas de vue l'objectif final. Les idées s'échangent soit en temps réel, si plusieurs membres du groupe se trouvent sur le réseau en même temps, soit avec un délai, quand chaque individu se branche sur la discussion grâce à un terminai portatif et un coup de téléphone au point d'entrée local. Que voit ce retardataire ? Le système reconnaît son nom, exige un mot-clé avant de lui donner le choix des conférences ouvertes actuellement, et lui indique le

Conférence de presse en visiphonie Paris-Nairobi par l'Intermédiaire du satellite « Symphonie », Unesco

nombre d'interventions nouvelles : « Vous avez lu 65 des 87 paragraphes qui composent cette conférence ». C'est à l'utilisateur de choisir s'il veut tout lire, ou seulement suivre un certain fil conducteur (« imprimer les paragraphes écrits par Bontemps depuis le 15 juin sur les semiconducteurs ») avant de composer sa propre intervention et de l'adresser au groupe de ses collègues qui à la même heure, peuvent être en train de sommeiller à Londres ou de pêcher à la ligne en Californie.

Les assemblées

Une Assemblée, dans notre nomenclature des télé-conférences, est une série de « séminaires » conduits de manière parallèle. Par exemple, le laboratoire National de Brookhaven nous demanda en 1974 de mettre notre système à sa disposition pour une série de débats sur la pollution par le soufre. Six conférences simultanées furent organisées, avec des participants représentant des centres de recherches, des organismes gouvernementaux et des hôpitaux aux Etats-Unis, au Canada et en Grande-Bretagne. Ces conférences durèrent deux mois et couvrirent la discussion d'effets biologiques, de modèles mathématiques, et du développement possible de nouveaux appareils de mesure. L'une des conférences servit simplement de bibliographie à l'appui des interventions faites dans les autres discussions. Une telle utilisation d'un système de téléconférences exige une bonne préparation et une certaine discipline, mais elle permet des résultats remarquables à un coût raisonnable. La moitié seulement des participants se connaissaient dans la conférence en question, et le prix des voyages aurait été prohibitif si une réunion face-à-face avait été nécessaire.

Les rencontres

Le mot « rencontre » traduit mal l'expression américaine « encounter • qui suggère un échange très rapide et une confrontation intellectuelle et émotionnelle. Il est difficile d'imaginer qu'une telle dynamique de groupe puisse se transposer aisément sur ordinateur et s'exprimer à l'aide de notes tapées sur un clavier. C'est pourtant ce que nous avons pu observer à maintes reprises. Des crises artificielles ont même été créées pour placer les participants dans un état de tension psychologique où ils devaient former des coalitions et prendre des décisions rapides : ces expériences (au cours desquelles les temps de réponse et les vitesses de frappe étaient enregistrées ainsi que la fréquence et la longueur des messages publics et privés) ont démontré que les télé-conférences offraient une alternative aux longues discussions téléphoniques ou aux échanges de télégrammes angoissés dans les situations de crise. Non seulement on y gagne en clarté (les messages sont imprimés dans la langue d'origine et peuvent être traduits avec précision) mais le taux d'information est plus élevé puisque l'ordinateur ne limite pas la séquence et la fréquence des échanges de sous-groupe à sous-groupe. Au cours d'une de nos expériences, conduite en deux langues (français et anglais) douze participants avaient à résoudre une crise internationale sous la direction d'un psychologue résidant à San Diego, près de

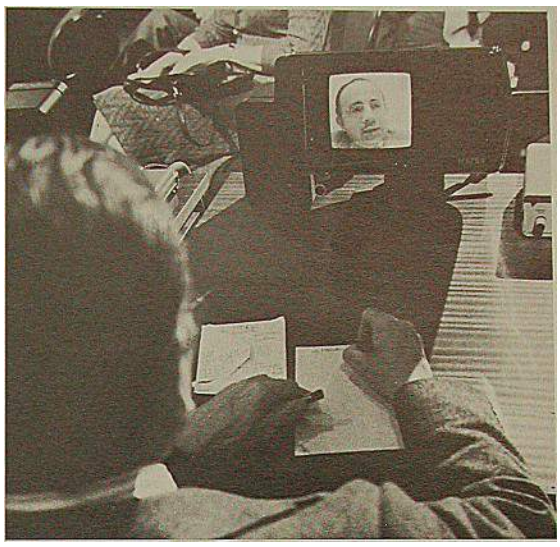
la frontière mexicaine. Les autres membres du groupe étaient à Montréal, à Londres, à Bruxelles, à Paris, à San Francisco, et dans plusieurs autres villes des Etats-Unis. La conférence dura quatre heures, dans une atmosphère de crise qui dépassait les espoirs des auteurs de la simulation et démontra clairement la supériorité de l'ordinateur aux méthodes audio-visuelles de téléconférences, dans une situation où la précision du texte est essentielle.

Les questionnaires

Enfin, il est possible d'imposer sur une conférence une structure formelle qui la transforme en questionnaire. Les prévisions qui s'appuient sur l'interaction entre experts utilisent des séries de questions, souvent formulées en termes de probabilités. Lorsque le groupe a répondu à chaque question on peut même tracer la courbe qui représente l'intégration des réponses, puis ouvrir une discussion libre. A chacun de ces cinq modes d'application correspondent diverses contraintes et différentes méthodes de préparation de la conférence et de présentation des résultats. Elles ont en commun le fait que les participants sont libérés des contraintes habituelles de temps et d'espace, et qu'ils utilisent un matériel simple — un terminal qui ressemble à une machine à écrire sur laquelle on branche un téléphone. Le système lui-même est assez simple pour être appris en un quart d'heure par un utilisateur qui ne connaît rien à l'informatique. Quant à l'ordinateur lui-même, on ne le voit pas puisqu'il est branché à un point quelconque du réseau.

Résultats pratiques : quelques exemples

A partir d'août 1975 une télé-conférence a utilisé le système PLANET pour relier et maintenir en communication permanente les 17 équipes conduisant des expériences sur le CTS (satellite pour la technologie des communications). Ces équipes appartiennent à des centres de recherches et des entreprises comme Westinghouse et Comsat; enfin, à des utilisateurs tels que des hôpitaux et des écoles. Au cours de cette série de conférences (qui se poursuivent actuellement encore) la plupart des échanges furent du type « Notes collectives » et donnèrent lieu à des observations sur une plus grande flexibilité des heures de communication, une plus grande précision dans l'échange des informations, une réduction des délais pour la transmission de données (telles que tes allocations de fréquences), et une grande aptitude à résoudre des problèmes de groupe, comme des pannes



UNESCO

occasionnelles dans l'alimentation électrique du satellite.
Une conférence de type « séminaire », qui dura plusieurs mois, fut aussi organisée par la NASA pour relier divers groupes qui composaient un rapport sur l'avenir des transports interurbains. Il s'agissait là de critiquer et de corriger différentes versions successives d'une important document, chaque sous-groupe étant responsable d'un chapitre particulier. Ces sous-groupes étaient dispersés dans tout le pays. L'utilisation de l'ordinateur n'élimina pas complètement la nécessité de réunions « face-à-face », mais elles permit d'en diminuer la fréquence (une fois tous les deux mois au lieu d'une fois par mois). Or le prix de ces réunions était considérable, puisque quinze groupes devaient envoyer un représentant à Washington, et que chacun perdait en moyenne deux jours de travail.
De tels exemples sont aisément généralisables et transférables au cadre de l'entreprise, à condition que l'on tienne compte de deux facteurs :

— la différence fondamentale entre la télé-conférence, qui est un média, et les produits de la programmation ordinaire, comme les systèmes de gestion de données; il est important aussi de ne pas confondre les téléconférences avec le courrier électronique;
— les effets psychologiques et sociologiques de la communication par ordinateur posent un problème d'entrainement du personnel, de choix des modérateurs, et de composition des groupes, qui n'est pas toujours simple.

Dans le domaine des télé-conférences comme dans les autres aspects de l'automatisation du bureau, on trouve donc un technologie efficace et aisément justifiable sur le plan des prix de revient, mais on trouve aussi une série de conséquences pour l'organisation, et même le germe possible de nouvelles professions. L'introduction des télé-conférences dans l'entreprise doit s'appuyer sur une analyse des buts et des moyens, et choisir parmi les cinq modes d'application que nous avons énumérés. Si cette analyse est bien faite, elles fournit à l'organisation un nouvel outil de gestion qui est puissant et et versatile.

«

Note:

// faut noter une confusion dans ta terminologie. Une téléconférence peut se faire par satellite entre continents pour véhiculer des images. Une téléconférence par ordinateur implique un stockage des messages pour faciliter la communication dans un réseau de participants *dispersés et en liaison discontinus.*

CONFER at the ISTA Congress

by Karl L. Zinn *

*Computer conferencing is being strongly recommended for use in linking participants who are widely distributed geographically, whether across a large country like the USA, or on different continents. Increasing numbers of * long-distance » conferences of this type are now in operation.*
Another use of computer conferencing is to assist the communications at a particular meeting held by gathering the participants together at one place in the usual manner. There are few examples of this « on-site » computer conferencing and we are therefore pleased to be able to present this report of the use of such a technique during the course of the 2nd International Congress of the International Society for Technology Assessment (ISTA) which was held in Ann Arbor. Michigan in October 1976.

It should be noted that during the ISTA Congress 16 computer conferences were launched in parallel for the duration of the Congress with the possibility that others could be started if participants so desired.

The Organizer's Guide to CONFER is reproduced in this issue on page 414. The Pocket-guide to CONFER, for conference participants, is reproduced as a Box within the body of this article.

* *Center for Research on Learning and Teaching University of Michigan, Ann Arbor,*
Partial support is provided by the National Science Foundation for experiments in computer-aided communications (through grants numbered SIS75-12880 and NCS76-22014), The projects are directed by Karl L. Zinn; the software was developed by Robert Parnes.

Computing and telecommunications were used during the Second International Congress of the International Society for Technology Assessment (ISTA) to facilitate the discussion and contribute to the Congress report. In particular the telecommunications activity was designed to enhance interaction on substantive issues and convergence on conclusions and interpretations. Only incidentally were we conducting an experiment or trial (with support from the National Science Foundation, USA) for a community of potential users of computer-aided conferencing.
Therefore, the computer terminals and related staff were there to help participants gain more at this Congress, and also share more, perhaps leaving a more useful written record. But computing resources for modeling were also there to be explored and tested. In any case, the computing activity was subordinate to Congress discussions and products useful in the field of technology assessment (TA).
A supplemental document provided information about computer-aided communications being offered in connection with this Congress (reproduced in abridged form on page 418). We set up resources and procedures in such a way that this document was not necessary. However, those who wanted to obtain some overview, gain specific guidance, or just explore for curiosity's sake, found additional and helpful information in this guide. Those who wanted to use the facilities in the least time necessary could go directly to a user terminal and rely on student aides to explain and assist. Those who wanted to use this supplement to the Congress program found information arranged in three sections : resources, services, and evaluation. One could go directly to the services section for information about specific techniques. Evaluation procedures were summarized (or those who wished to help in assessing the impact of this communications medium on the Congress.
Drafts of the resource materials being developed through computer conferencing were also provided in subsequent sections of the program supplement, for example, a glossary, list of current projects, and key writings in technology assessment.

Rationale for computer conferencing within professional communities

We proposed that computer-based communications would extend the benefits

of a face-to-face conference in quite interesting and useful ways. Indeed, we found some contributions not anticipated in all our planning : Some of these are mentioned later in this note. First we describe our hypotheses for a specific experiment on support of communication at a professional meeting. Potential contributions of computer-aided communication to activities and substance of the Second International Congress on Technology Assessment (ISTA) were explored with specific software and procedures. These included :

— Collecting substantive information in parallel with technical sessions (to supplement and extend written papers).
— Posting notices for special interest groups.
— Arranging site visits in the vicinity of the site of the meeting.
— Scheduling additional informal discussions and special activities.
— Annotating supplementary information, e.g., directory of work in progress.
— Obtaining reactions of attendees to the Congress.
— Demonstrating computer as a tool in the profession (technology assessment, in this case).

We observed some significant communication activity in computer-aided conferences in all of these categories.

Consequence

Intended outcomes of computer use (in association with the Congress) that might be supported by data were listed in our proposal to the National Science Foundation as seven hypotheses :

1) Computer-based conferencing is easily used by a significant proportion (40 %) of attendees during an international meeting. Special attention needs to be given to making the introduction an easy one, providing teleconferencing aides on the site as well as a convenient pocket guide. Many attendees will be too busy to try, and a few will be definitely opposed to such use of technology.

2) Costs are small compared to those associated with travel and time of participants. Analysis of travel costs versus computer and communication costs is easy, and has been done many times. We need to determine values which some attendees and non-attendees associate with time required to attend a professional meeting, and the benefits of the limited personal contact which can be achieved through computer communications without being in attendance.

3) Participants and expert observers report benefits. Benefits are very difficult to pin down, especially in complex situations observed for only a short time. We are dependent on reports of participants, supplemented by opinions of some persons expert in computer-based conferencing.

4) Participants report (increased) interest in potential contributions of computer-aided communications to professional meetings, and the practice of their profession (technology assessment, in this case). Confirmation of this assertion is sufficient justification for the experiment The sponsor is interested in bringing positive instances of telecommunications technology to the attention of this and other professional groups.

5) Some fraction of attendees (10 %) will continue computer-based conferencing on Congress topics afterwards. During the Congress all participants were invited to continue for about six weeks from other locations. The incentives include obtaining additional information, contributing to the report of the Congress, and learning more about computer-aided conferencing.

6) Reports of the Congress show benefit in substance. The Congress will have no published proceedings. Instead a report will be prepared which interprets the current directions of the field. Some of the material for this report may be taken from the computer communications during and following the Congress.

7) Congress staff reports advantages of computer assistance. Computer-based communications became a tool of staff for the Congress in the weeks preceding. Some services were offered to attendees that would not have been tried otherwise; "some tasks probably were handled more effectively and efficiently than without computer assistance. Primary data on staff activities are difficult to interpret; support for this hypothesis needs to be found in reports of staff (especially those not already experienced in use of CONFER or committed to use of computer-based conferencing).

Initial analysis of computer and registration records shows that hypotheses 1, 4, and 5 are confirmed. About 40 % of those registered used CONFER directly at least once. At least 15% used CONFER one or more times à day. Continuation after the Congress appears to include at least 10 %. We did not expect all 16 conferences to be active. One of them, the caucus on technology assessment in the area of automobiles, had no items entered. All other caucuses had at least ten items and eight participants. Some had over 100 new items of information entered by 15 or more participants. Interpretation of the other hypotheses will be based on telephone interviews with a sample of participants in the Congress. Stratification will assure representative comment from off-site users, program committee members, student aides, non-users, and users at various levels. Some of the comments will be best intepreted knowing the context. Even in this exploratory research some group differences may show up important considerations for redesign of the software or procedures for application of computer-aided conferencing in professional meetings.

Resources for telecommunications at the Congress site

The primary telecommunications resource provided at this Congress was a computer-aided communications system. A grant request by the University of Michigan to the National Science Foundation was funded (or experimentation on the contribution of computer-based communications to a professional conference. The primary computer system used was the Michigan Terminal System (MTS) and the software called CONFER. An alternate system, the PLANET computer-based conferencing system available through the TYMNET and TELENET data networks, was offered for more economical telephone communication from remote sites, but direct communication with on-site conferencing was selected by ail off-site participants.

Audio and video resources were available as well. Some tapes were recorded in the weeks preceding the Congress and some borrowed from existing libraries. Additional tapes were recorded during the Congress, not only from sessions but at interviews specifically scheduled for the purpose. These were available on the site for review by participants at any time. In particular, « recap » sessions were scheduled in the evenings.

The computer was also used to demonstrate tools of technology assessment, for example, models and analytic procedures on the University of Michigan computer and elsewhere. These tools were then discussed in the computer-aided conferences.

Services offered via computer communication

Exchange of messages with other participants all of those registered for the conference were included in a general communication medium called ISTA : SCHEDULE. A list of participants' names was included at each user terminal on the Congress site. It also

(continued page 416)

A pocket guide to CONFER for Computer-aided conferencing at the ISTA congress, 24-28 October 1976, Ann Arbor, Michigan, USA.

Characteristics of CONFER

Welcome to the ISTA Congress and to the new world of computer enhanced conferencing. You will be joining a very interesting experiment on facilitating professional communication.
CONFER is the name of a set of computer programs which will assist you as you interact through MTS (the Michigan Terminal System) with other participants in one of the computer-based conferences operating during the Congress. Some of the participants will be in Ann Arbor, and some elsewhere.
CONFER is used to organize the substance of a typewriter discussion into a set of units called " items " . You may type an item into the computer at any time and say in the text of the item whatever you deem appropriate. Each item is given an acquisition number by CONFER to help identify it. But CONFER helps one find items (or information) without knowing the numbers assigned to them. As a data base develops, CONFER provides you with substantial guidance by which to follow a " conversation " through a series of items entered at various times.

CONFER provides you the freedom to participate as you wish. You may read items at your convenience or not at all; you will be invited to comment briefly (or vote) on each item when displayed. The balloting is confidential; all comments entered to date are presented anonymously and in random order.

CONFER provides you with the capability for communicating privately with any other participant (or group of participants) in the conference. You may transmit messages to other participants at any time: they are received in message files right away but can be read at the convenience of the recipient. You can direct CONFER to remind you later to follow up private communications or check on response to your public communications.
As you gain familiarity with CONFER you will find many capabilities to make your conferencing activity efficient and enjoyable. This Pocket Guide provides only a few points for reference. User documentation provided at each terminal on the Congress site includes a User Guide. Reference Guide, and Notes for Use of MTS.
On-line help (enter ?) provides a page of reference information relevant to that point in you conversation with CONFER. You can also send messages addressed to • staff . for interpretation of CONFER characteristics in your particular conference.

Special keys on user terminal

A number of special keys marked on each user terminal will be helpful. The use of these keys in CONFER is described below. The name of the key is enclosed within brackets to indicate that it is a key to be pressed rather than a set of letters to be entered.
To enter a command or text into CONFER:
(RETURN) signals MTS and CONFER that you have completed one line of entry CONFER will not take any action on a line of typing until you have pressed (RETURN). Therefore you can backspace to correct before you press (RETURN). Sometimes just (RETURN) is an appropriate entry into CONFER.

To correct typing errors:
(BACK SPACE) or (CONTROL-H)) signals MTS to delete single characters on the line you are entering. On some terminals the print mechanism will back up for you to strike over: on others it only types a special " correction " character to show the number of characters erased. Use this key to correct typing errors on the line you are entering. Back up and retype the remainder of the line from the point of correction.
(LINE DELETE) (or (RUBOUT)) deletes the line you are currently typing. The print mechanism will return to the left margin on some terminals. MTS will print #. Use this key to delete the entire line you are entering if you wish to start over.
To interrupt computer :
(ATIN) or (INTERRUPT) or (BREAK) interrupts the computer. CONFER stops what it was doing and resumes with the next appropriate step in you interaction.
To conclude *text* entered into CONFER :
(ENDFILE) advises CONFER that you have completed entering a set of lines (ENDFILE) is a key on some terminals (usually (CONTROL-C)) but on any terminal it can be accomplished by entering the characters SENDFILE at the start of a line. Typically the text of an item or a message will cover two or more lines. (ENDFILE) will tell CONFER that no more lines of text are coming and you are ready to initiate further action.
Summary pages have been prepared describing the use of various kinds of terminals on the Michigan Terminal System (TI 733. Decwriter, GSI 300 Q, Tektronix 4023 and others). These have been attached to corresponding terminals in the Rackham Building.

« What to do if... ? »

What if 3-4800 is busy or keeps ringing?
Call back several limes and il il is still busy dial 3-0396 or call 3- 0300 and switch to half duplex. If you try several times and receive no answer, call 3-0420 to find out from a recorder message if the system is down, that is, not working.

What it the computer does not respond ?
If you do not press the (RETURN) key the computer will not respond. Or if many people are using the computer it will take longer to respond. (Usually 2 to 4 p.m. is a heavy load time). wait a minute to see if the computer responds. If it does not there are several things you can try. Press (RETURN) again and wail a minute. Try the (ATIN) key. If nothing happens the computer may be shut down and you may have to wait until later to use it. (You can call 3-0420 to find out if it is down).

What if I make typing errors?
Do not worry about small typing errors when typing text of messages, items, or reminders. Only make corrections if your message is unclear or you want to make a substantial change.
Typing errors made in commands or in giving information to the computer may cause the computer to misunderstand. For example, when you direct the computer to send a message to a participant but type a wrong letter, or just different spacing, CONFER won't find the participant listed. (To avoid this, type only the first few characters of the last name. Usually this is enough to identify uniquely the participant.)
If you wish to make a correction in a line while you are still typing it (that is, you have not yet returned the carriage) you may delete any number of single characters or the entire line. To delete the entire line press the (DELETE) key before returning the carriage. To delete single characters press the (BACKSPACE) key and retype all the characters you have deleted.
If you made a mistake on a previous line (that is, you have pressed the (RETURN) key since the mistake), you can use the MTS editor. By commands to the editor you can change or delete anything you have typed into a file.
When CONFER has recognized that you have finished typing an entry.

it will give you a chance to use the Editor. Press the one character e: this connects you with the editor program of MTS. When it is ready to receive an Editor command, your terminal will type a colon {:}.
Enter stop to leave the editor.

What if I forget a confer command ?
Typing ? at any DO NEXT ? will give you a list of the possible commands. If you would like a more detailed description of each command type the command and a ? You may also receive help from CONFER by typing ? at any place you are required to give input, except when entering text.

What about other conferences I might like to join?
The MTS command SCOPY ISTA : CONFERENCES provides a list of conferences with brief descriptions taken from the opening items. Any new conference wilt be given at the beginning.

What can I do about slow response lime of the computer?
Some days the number of users and the size of the jobs being run by the computer preclude rapid interactive uses. Aides will enter things for you at off times : before 9 or 10 am. during the noon hour, after 4 or 5 pm.

What about unexpected messages from MTS?
CONFER has been designed to interface persons without any knowledge of computing with the considerable capabilities of MTS. Occasionally the CONFER programs can not provide the information MTS is seeking to carry forward your communication activity. Some message will appear that has little meaning to the CONFER user without experience. Usually you can restore your communication by (RETURN) or entering . cancel . than (RETURN),
If CONFER had to return you to MTS. usually it will be with message ENTER $RES TO REENTER CONFER. Further indication that you have left CONFER is the printing by MTS of its prefix character # . If $ RESTART doesn't work you con also begin with the SOURCE command, II you can't get MTS or CONFER started at all, see one of the aides, or call 763-ISTA.

A pocket guide to CONFER cont...

Some sample editor commands

print/file Print the complete text,
print 4 6 Prim lines 4 through 6.
print "L Print the last line.

after 4 'ix' 'is' Alter the first occurrence on line 4 of the character string ix to the string is.
a "bob" Delete the first occurrence of the character string bob from the current line.
undo Restore the text to the status before the last edit command.
delete 5 Delete line 5.
insert 5 Insert after line 5 (and before the next line in the file).

The editor prompts each line with a ? until it gets a blank line. That is, press (RETURN) in response to ? to conclude insertion.

insert "L Add lines to the end of the file. (Insert behaves as described above),
stop Leave the editor.

Access to MTS

Presently CONFER is available on MTS, the Michigan Terminal System.

operating on the University of Michigan computer in Ann Arbor. Access to MTS requires use of an ID (identification number) obtained for the purpose.
As a participant in the ISTA Congress you have been provided an ID for use o(CONFER. Passwords protect against accidental misuse of another's ID. You reach MTS by calling a number In the University

Centrex system which connects your user terminal to the computer.
Users coming in through the MERIT Computer Network obtain infor-

mation from the local computing center or MERIT node.
Within the University Centrex phone system users dial only the last live digits, usually 3-4800.
In lull duplex operation, the computer waits lor the user to identify

the terminal with a single character (eg. "7" for the TI 700 series user terminal and " d " for the Decwriter). If you don't know the code, lost press (RETURN). The recognition character for each terminal at

the Congress is written with the phone number on a tag. In half duplex operation the computer waits for the user to type " go " and press (RETURN).

A sample of the sign-on sequence follows. The characters which were

typed by the user are indicated with // in this copy. (For this example

the user dialed 3-4800 using a GSI 300 Q).

-xf

d

//

MTS; ANN ARBOR (CC14-00109)
sig umb9 //

If you would like to just to observe a conference, but are not yet ready to
join it, look for transcripts of the conferences (11 x 14 computer listings) near each terminal and in the display areas.
Additional conferences can be formed on the computer in response to special interests. Transmit a message to Karl Zinn or Bob Parnes.

Some things to try :
react with " views " (votes) on items
enter items conveying questions or comments
transmit messages to schedule extra discussions

check for incoming messages from others

check the notices for schedule adjustments

check the agenda for grouping of new items
organize you own grouping of items of interest
forget items of no interest
remind yourself with notes of things to do later
copy ISTA : CONFERENCES for new topics.

Summary commands:
I CAN'T DO THAT ENTER? FOR HELP
DO NEXT?
A list of CONFER commands that you can enter at DO NEXT follows.

Enter the command followed by ? to get more information about each one. You may " ATIN " this printing at any time.

Item output commands.
ITEM — displays descriptor, text, references, votes, and gets your vote
DESCRIPTOR - displays descriptor and references.
VOTES - lets you see the votes on an item, and gets your vote.
Item Input commands.

ENTER - lets you enter an item into the conference.
UPDATE — lets you update an old item and enter the updated item into the conference.

Item classification commands.
FORGET — lets you tell CONFER which items you want ignored for your conference activity.

ORGANIZE — lets you create and destroy categories, categorize items and make a selected category * the items.
AGENDA - lets you see the agenda categories and make a selected category the * items.
WHICH - lets you search the conference for a specified character string and make the items having it the * items.

Message related commands.
MESSAGES - lets you process messages transmitted to you or stored

TRANSMIT — lets you transmit messages to others.

Other useful commands.
STOP — terminates the current CONFER session.
BRIEF — lets you view and change your brief notice.
PARTICIPANT — lets you check on conference activity of participants and display their brief notices.
NOTICES — lets you view notices from the conference organizer.
REMIND — lets you enter and view postdated reminders to yourself.
? - gives you this printout.

— lets you assume an alias ID.
KEEP — lets you save the text of an item, message, or reminder entered at the previous DO NEXT ?
$ — lets you enter an MTS (rather than CONFER) command.

Special purpose commands.

JOIN - lets you join another conference.
= - lets you change conference IDs.

MTS — lets you return to MTS.

Except for STOP and MTS. which must be spelled out, you may use just the first letter of each of the commands at DO NEXT? Al any time when CONFER prompts you for input (except when there is a " > " in the left margin), you may enter ? to receive assistance from CONFER.

Conferences prearranged :

ista : schedule

ista : aspects

ista : paradigms
ista : perspectives ista : STI
ista : writi ista ; development

ista : projects
ista : auto ista : education
ista : health

ista : agriculture

ista : solar

ista : space

(others may be defined)

could be obtained at any remote site by listing ISTA : PARTICIPANTS. Messages sent to any of these people were received in their « message files » immediately. How soon they were viewed by the recipient depended on his or her frequency of use of the computer system.

2. Planning supplementary meetings and visits.
One could scan the ISTA : SCHEDULE conference for notes and notices about additional sessions or special interest meetings and possible visits to projects or offices nearby. One could enter *a* suggestion for such a meeting or visit, or enter a specific request for travel. To check for replies one would join the conference at a later time and request a display of responses to the item. Prime references attached to the item indicated which other participants had responded in detail; the « votes/feelings » provided some brief notes, perhaps identifying others who were interested.

3. Annotating and extending the resource lists.
Three or four resource lists were assembled from a variety of sources. Each of these was intended to be helpful to participants in the Congress, particularly those who were not familiar with the terms, literature, or current activities in the field. Each of these is likely to become a part of the report of the Congress. Many participants helped by extending and adding to these lists, reviewing copies near each of the user terminals on the site (or listing them from the computer) and entering « VOTES » or « ITEMS » which provided elaboration.

4. Discussing issues related to TA methodology and perspectives.
Some of the participants found it helpful to explore a variety of issues and ideas through a kind of computer-aided « caucus » in parallel with the sessions and discussions of the Congress. The convenience of getting information in and out of the computer made it possible for attendees to carry on this additional dimension without interfering with their usual approach to sessions and conversations. Furthermore, the issues, questions, and tentative conclusions emerging from these « conferences » were introduced into the workshops Wednesday and the final plenary discussion Thursday. Nine such topical « caucuses » were defined, one for each of the major themes of the Congress. Three more were set up for discussion of aspects, perspectives, and paradigms of technology assessment.

5. Reacting to the substance and procedures of the Congress
The response forms for sessions and general procedures of the Congres *were* included on the following pages of the program. Additional copies were available near each session room entrance.

Participants could write any kind of reaction (whether a question, suggestion, comment, or substantive contribution) and have them processed through the computer-aided conferences. If substantive, an item appeared in one of the topical sesions. If procedural. the suggestion was entered into the « SCHEDULE » . conference or the staff conference. Those working on the telecommunications experiment invited any kind of input which might enrich the data on the experience.

Technical assistance

Experience with CONFER was very favorable. Many people oriented themselves in five minutes to the sending and receiving of private messages as well as entering and retrieving public items. Because CONFER has many capabilities for searching, reorganizing. and developing information, the satisfactory demonstration of a real conference takes at least hall an hour, and interested participants were likely to spend an hour.
In order that the conferencing activity would not be a distraction, we arranged to have teleconferencing aides near all terminals on the site of the Congress at those times most likely for use by participants. These students had used CONFER before (although never alt on one site and contained within so short a time as one week) and all were interested in technology assessment. Although they had no special training in CONFER or experience in orienting new users, we were sure they could be helpful in a number of ways.

When participants approached a user terminal, it would likely be connected to the computer system already. If not, they asked one of these aides to do so for them. We encouraged participants to call upon a student as an intermediary with the computer, even giving dictation it the student's typing speed was faster. The student could interpret a participant's intentions to the computer and cover any difficulties that might arise due to an interruption in communications or operating system.

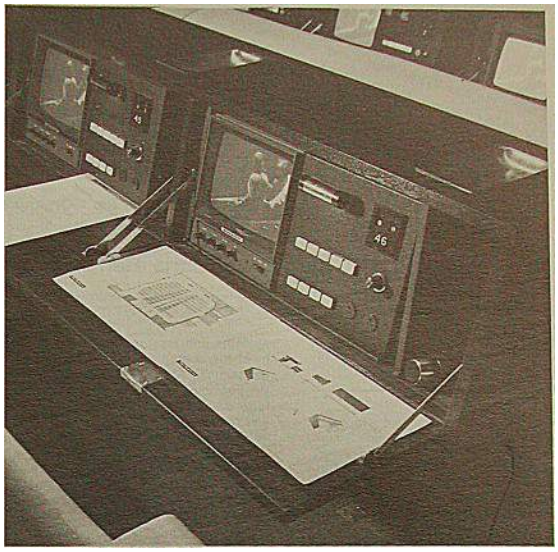
As with many such timesharing systems, the user on MTS is identified by the computer when « signing on » or « logging in ». Because of the cost and delay caused by one user signing off and another signing on (and reloading the software) we introduced a facility for switching identity. The teleconferencing aides could easily participate as someone else, although special access codes were set up for them to restrict this feature to trained staff.

The computer was available from 8 a.m. until 4 a.m. the next morning. But when participants found they could not get to a terminal, or found all terminals were busy, they could fill out response and message forms for later entry. Some used these forms to avoid having to type material into the computer themselves. Participants were encouraged to dictate as well as provide handwritten copy for entry of messages or items. For most efficient entry we routed copy to the most capable typist. To facilitate effective distribution of work, participants left forms in trays about the Congress site.

CONFER was not the place to convey detailed information. It did perform well a number of functions : planning, scheduling, organizing, critiquing, and seeking consensus. Full copies of materials that could be circulated on the site of the Congress were not entered into the computer. We did not intend to use the computer as a printing machine, listing separate copy for each individual.

A systematic reporting of benefits observed by participants for computer-aided communications during an on-site conference is in progress. For now, a few anecdotes are reported here just to characterize the range of incidental benefits.

On the first day one of the session organizers lost his raincoat, and entered an item in the general section of the computer-aided conference to that effect, 1 had no hope for his finding it; in this situation a note on the bulletin board would not have brought it back, and it was not of sufficient consequence to announce in a plenary session. However, a day later an anonymous comment line was appended to his item in the computer; it reported that his



coat had been returned to the fourth floor coat room !

An enterprising student entered her resume in two or three caucuses as well as in the general section. I was concerned that some would be offended by this, especially since the text was repeated in a number of places. But when one receives conference material from the computer it can be rejected or skipped simply by pressing the INTERRUPT key on the terminal as soon as it is recognized as familiar or otherwise not of interest. This student did get an interview before the end of the Congress, and both parties appear to be pleased !

Other minor successes haven't been confirmed yet : seeking reference for data to be used in a Congress presentation; identifying persons interested in additional evening sessions; organizing a continuing special interest group. But the most significant benefits will show up in the quality and extensiveness of the Congress Report now being prepared with computer assistance.

We will continue our exploration of computer assistance with technical communication in scientific communities. Additional opportunities for experiments present themselves each month as more individuals and organizations discover the advantages of computer-aided conferencing. We aid all we can, counseling caution in committing resources to new media for communications where group members may not be receptive to the technology, or purposes may not be served within the constraints. We select for systematic data collection those groups and situations which appear to add additional dimensions to our understanding of this new resource for educational and scientific communication.

Organizing a computer-based conference

an abridged version of the « Organizer's Guide to CONFER II » *

Robert Parnes, H. Chris Hench, and Karl L Zinn**

L Rationale for computer assistance

This section provides some suggested contributions of computer-aided conferencing to seminars, interdisciplinary studies and nontraditional teaching situations.

COMPUTER ASSISTANCE WITH SEMINARS :

In the seminar situation computer assistance contributes in an interesting way to the interaction between teachers and students among teachers, and among students. For example, the remarks of a resource person called upon near the beginning of a seminar are recorded and conveniently available for later resource people to review and to build upon. Each student can see the comments of others and the questions and faculty responses. A student can test out some arguments in writing, before writing a paper for presentation to his or her seminar. At the same time, the computer message facility may be used to identify and schedule discussion groups and other spontaneous or unplanned interaction.

The instructor may use the conference to maintain and improve a syllabus for the seminar, adding new readings and topics as they are introduced by students and resource persons to augment the draft prepared in advance of the seminar. At the end of the semester the instructor has in computer readable form a draft of an improved syllabus and related materials for the next offering of the seminar.

Different views within a seminar emerge readily in the conferencing format. Two or more individuals may enter comments on a controversial item simultaneously without one interfering with the flow of ideas of the other. On the other hand, the hesitant speaker has ample time to organize a careful comment and introduce it into a discussion in a timely fashion. Indeed, if the conference organizer provides for it. anonymous comments may be entered to establish unpopular or self-conscious positions which might not otherwise be entered into a discussion at all.

Not all aspects of computer-aided communications contribute to conversation. Some seminar participants are reluctant to commit their preliminary ideas to writing, and some do not type readily. The procedures of computer assistance should accommodate individual preferences and skills, and offer options to the computer format (for access to information and initiation of new lines of discussion).

INTERDISCIPLINARY STUDIES :

Many interesting interdisciplinary discussions — potential seminars — arise in the course of University activities. Persons from different departments come together in social and recreational activities; some meet to conduct committee work; and incidental occasions arise such as in a changed meeting, in community activities and the like. Many potential benefits are not realized from these situations because continuing communication about topics only a part of specific disciplines is difficult to maintain. Face-to-face meetings are difficult to schedule, or occur only incidentally during other activities, the frame of reference of another discipline necessary to understanding a contribution to the discussion, may be difficult to acquire; progress may appear to be much slower than on work within one's own discipline.

Computer communication can help bring people together conceptually as well as overcome the obstacles of scheduling a meeting time and place. Selected resource materials from all contributing disciplines are conveniently accessed by all participants through computer assistance in the conference. A record of contributions is maintained for the information of all. Summaries and interpretations are entered by participants and periodically by staff for the conference. Each participant works at his or her convenience; use of telecommunication media should exploit the storage function so that past entries are available to new participants, and to those who have been absent for a time, and as needed by those who wish to review and interpret progress of an interdisciplinary group. Teleconferencing should be especially important to those significant groups which are not otherwise productive because the schedules and priority systems of participants do not permit the pleasant inefficiencies of traditional means of communication. Multidisciplinary groups tend to suffer just that situation.

indeed, the right kind of facility for teleconferencing will make it easier for a program to call on faculty members from different disciplines for contributions to curriculum discussions.

NON-TRADITIONAL STUDENTS :

Computer and communications technologies are of considerable importance in the future of education. Many of the persons that the University of Michigan hopes to reach will not travel to one of the campuses or even the extension centers. Many will not attend group meetings scheduled for the convenience of the instructor and the institution.

* *Extracts from the original document were selected by the editors with the permission of the authors. The unabridged version of the document was prepared with support from the Office of Science Information Service. National Science Foundation, Washington DC (Grant No. SIS75-12880). An example of a « Participants Guide » is given on pages 414-415 of this issue.*

** *Project CREDITS, Center for Research on Learning and Teaching (CRLT), University of Michigan Ann Arbor.*

Many will not tolerate semester schedules for courses as the primary means of access to information or certification of accomplishment. Computer-aidedconferencing has a potential for non-traditional students that should be explored now in anticipation of the very low cost of automatic information processing which is now predicted. The computer is helpful in scheduling, program planning and counseling. Potentially the computer is a very important tool for the storage, retrieval, and organization of information that describes programs and even the organizing of information that is the substance of instruction.

INTERACTION OF TEACHING AND SCHOLARLY WORK :

Academic staff at the University will become increasingly involved in teaching. The sources of funding for the University within the state become increasingly associated with teaching load. The costs of operating the University have put more pressure on handling numbers of students. In fact, most faculty members are increasingly interested in and concerned about serving students as individuals.

Computer-based communication has three important aspects for faculty involvement in teaching. First, it facilitates individual communication by one or a small group of faculty members with many more students than would be possible through face-to-face meetings, e.g. traditional office hours. Second, it extends the benefits of a conversation with one individual, since the record of that conversation may be stored and processed in the computer to be adapted and carried over to serve the needs of others in similar situations. Third, computer-aided communications can carry over to scholarly work. For example, the text of the more effective seminar discussions carried on through the computer may be adapted for use in textbook writing or even in scholarly communication.

II. Duties and role of the computer conference organizer

The conference organizer has the overall responsibility for the organizational and technical aspects of the conference. We have listed below some activities that were helpful for the conferences with which we have had experience. But keep in mind that not all will be relevant to every conference, and some conferences will require other activities.

Deciding to hold a conference. It is important to determine if your topic is suited for this method of communication. The main criteria should be the topic's ability to motivate interaction between prospective participants, In the past we have found that the most successful conferences are the ones that need CONFER; that is, the conferees have no other convenient way of discussing the topic. Most importantly, the participants must perceive that they will benefit from the conference. The optimum length for a computer conference is not predictable. Some have lasted only a few days; one lasted a year. The length should be dictated by the topic, the intended outcomes, and the available resources. We suggest anyone who is considering initiating a conference get some experience with CONFER. Experience with CONFER will enable you to better determine if CONFER can meet the needs of your group. Knowledge of CONFER will also enable you to assist participants who are newcomers to CONFER.

Time. Time is an important consideration for anyone thinking about organizing a conference. A conference will probably not be successful without a commitment from its organizer. The amount of time required varies from conference to conference, but. in general, we have found that preparation lor a conference requires at least 15 hours; closing about 5. An additional average of about five hours a week is needed to maintain the conference. This varies greatly from conference to conference. In some conferences the initiator of the conference is also the organizer. But in cases where the initiator is very busy, or for conferences that require a lot of on-going work, a conference « communications organizer » could be used for much of the conference maintaining work.

Obtaining computing resources. Once you have decided that you want to hold a conference, you must obtain compu-

Sample welcoming messages

Conference A :
Message from hench , chris (conference ORGANIZER)
Welcome to a conference for conference organizers. ORGANIZER began in January , 1976 as a means for keeping conference chairpersons in touch with each other. Because of the novelty of computer conferencing , organizers are facing new problems. ORGANIZER allows organizers to discuss problems and help each other , as well as keep informed of the latest CONFER software changes and documentation.
From the agenda which was just printed out, you can get an idea of the directions the discussion has taken. Much discussion has centered on various aspects of CONFER software — reactions to it , ideas for changes , ways to use it, and philosophy behind it. Bob Parnes, designer of CONFER and active ORGANIZER participant , has chosen to announce and implement software changes in ORGANIZER before other conferences. This conference has also kept each of us informed of the ways others are using CONFER. (See agenda categories information on specific conferences and uses of conferencing).

As a new participant, you are invited to enter an item about yourself and your interest in the conference. (For what others have entered see background, interests of participants).

To orient yourself to the conference, you might scan the descriptors of agenda categories for items of interest, and look at the latest several items to see what is currently being discussed. For a copy of all the items from the Computing Center at do next? item 1- 999 " print ".

Conference B :
Message from the organizer *(Karl* Zinn)
Welcome to an experimental conference using an innovative technique intended to aid productive communication among distributed members of a group . If we are successful, group and individual purposes will be well served with minimum wasted time or disrupted schedules. You should be able to participate when it is convenient for you, and in a manner you find worthwhile.
Since this is an informal working session trying out a written medium where before we were accustomed to the ephemeral spoken word, I suggest we encourage tentative statements and respect the rights of the authors to restrict distribution. The contents of this file or any copies of it should not be reproduced or quoted in whole or in part without permission of the organizer and the participant(s) involved.
A rather complete description of the CONFER facilities is available to you as you use the system. Enter " ? " for general advice at any point. Enter " XXX ? " for reference information on command XXX. I hero reproduced the reference information and can also provide draft of a primer on using CONFER lor messages and items (call 3-0158).
Robert Parnes , designer of the software, welcomes comment and suggestions through the conference (use the TRANSMIT command) or campus mail (CRLT, 109 E. Madison) . I hope the participants will discuss the agenda and procedures of the conference through the ITEM and MESSAGE facilities.
To find out what the system can do for you, you must experiment. To be helpful to others in the group, please participate regularly. When prompted for a one-line notice you might indicate for other participants how often you expect to sign on.
The first item (type ITEM FIRST to look at it) invites a personal comment on your interests and objectives for the conference. Type ENTER to respond with a lew lines of preliminary information. An agenda lor the conference will evolve from those statements (type A-GENDA to see how it is progressing).

ting resources (funds, file space, and IDs for the participants). The organizer or each participant can approach the person who allocates the computing funds in his / her department. The Computing Center uses a standard request form which needs the signature of a department chairperson or unit director. If you have questions or problems, Karl Zinn at CRLT may be able to provide assistance. Once you obtain authorization you can pick up your IDs and passwords at the Computing Center.

It may not be necessary to get an ID for each participant, since some may already have IDs suitable for the purpose. An ID reflects who is paying for the computing resources and for what purposes. If it is appropriate that you supply the funds for the participants, you will need to get IDs for them. Each participant must have a separate ID. For a single ID request (just the organizer's), 50 pages of diskspace (file space) and $100 of computing money is a recommended amount. (These estimates are generous. You can get by with less if the conference is not very active).

Multiple IDs are requested under « project accounting . provisions. You will be given one authorizing ID which will permit you to allocate funds to each participant. Instructions on allocating funds from an authorizing ID appear in the MTS manual. A suggested initial allocation is five pages of diskspace and $20 of computing money per participant. The total amount of money needed will vary depending on the length and activity of your conference. Inviting participants. No one knows what is the best number of participants for a successful conference. Some conferences have had as few as five participants; others have had 200, The number of participants is best dictated by the available resources, the topic, and the interest in the topic. A personal invitation to each prospective participant along with a written description of the purposes and goals of the conference is helpful. To encourage interest, include a statement of how the conference will be of benefit to them. You should also inform them of the expected length of the conference, the intended outcomes, and the source of computing funds.

Preparing participants. Those who do not know how to use CONFER will need « A User's Guide to CONFER II ». Also recommended is « An Introduction to CONFER II », a 13-minute videotape which gives an overview of basic CONFER capabilities. Both the Guide and the tape are available from CRLT for the cost of reproduction. Users may also want a printed copy of the « Reference Guide to CONFER II », which contains complete information on all commands and modifiers. (This is available from the high speed printer using the MTS command SOURCE CRLT : CONFER. GUIDE).

In addition to the other documentation, each conference that requests it can have a specially adapted « Pocket Guide to CONFER II » (see this issue, pages 414-415. This Pocket Guide is a brief pamphlet containing summary information about CONFER and the conference. As organizer, you will adapt, drop, or add sections of the Guide to meet the needs of your conference. An in-person demonstration of CONFER is important to help put hesitant users at ease. Lack of participation can often be attributed to anxiety about working with an unknown technology. New users should be encouraged to experiment with CONFER capabilities Let them know they can do no harm to the software by making mistakes. The organizer should be sure participants have access to terminals. Lack of participation in a conference is often the result of unavailability of terminals A list of public terminals is available at the Computing Center and CRLT Organizers might try to determine locations of non-public terminals that may be available to conference participants, or consider loaning terminals to participants during high-use times

Off-line activity. If a participant does not have access to a terminal, there are some ways s / he can still interact on a limited basis. Copies of all items can be listed and sent via campus or U.S. mail. A person with access to a push-button telephone can listen to messages and items read via the Audio Response Unit.

Generating input off-line presents more of a problem. The organizer might enter messages and items on behalf of a participant. One conference solved this problem by hooking a remote control tape recorder to the organizer's phone to record dictated entries which were later entered into CONFER. it is important not to depend entirely on off-line activity for participation. It is suited only for occasional or short term use, for example, if a participant goes out of town and still wishes to participate. If your conference's success is dependent on off-line participation, it will probably encounter much difficulty.

CHECKLIST FOR DECIDING ON USE OF CONFERENCING

Characteristics of the Group
- *modest size (usually 5 to 50 members)**
- *geographically distributed*
- *strong incentives to communicate*

Characteristics of the Topic
- *multiple approaches desirable*
- *written communication is adequate*
- *reference information should be at hand*
- *computer-based data are useful*
- *computer modeling is relevant*

Resources and Scheduling Considerations
- *easy access to terminals*
- *good access to conference computer*
- *frequent participation required (replacing meetings)*
- *staff available for technical assistance*
- *deadlines to be met*
- *provisions for off-line activity (listings, indexes, etc.)*

Incentives to Use Conferencing :
- *save travel cost*
- *increase meeting efficiency*
- *record conference progress*
- *open meetings to larger group*
- *explore new means for education*
- *develop new skills for interactions with colleagues*
- *research new tools for decision making*

* *N.B. Many small conferences can take place simultaneously and with overlap in participation.*

Sign-on, sign-off, welcoming messages and notices. The organizer is responsible for writing the sign-on and sign-off messages, which are the identifying words which appear each time you sign on and off a conference. When your conference is set up standard messages will appear here. You must edit your own messages into the source tile before the conference begins. They can be changed at any time. CONFER files are described in detail in . TECHNICAL INFORMATION ». The sign-on message can be used to call attention to important items or recently posted notices.

Another part of the source file is the welcoming message. This is the message from the organizer which is automatically sent to participants when they register for the conference. This, too is written by the organizer. This message should state the goals and benefits of the conference. It might also contain suggestions for interacting with CONFER. This message should be friendly and encouraging.

Notices, also edited into the source file by the organizer, are used like a bulletin board to keep participants posted on events or activities of special interest to the group. To stimulate participation, you should post notices often.

First items. Before any participants register into the conference, you should have at least one or two items already entered. These items should be used to state the purpose and intended outcome of the conference. You can use the items to introduce yourself and invite others to do the same. These first items can also be used to set the tone for entries by other participants. Friendly, informal items will help create a non-threatening atmosphere and encourage participation.

Agenda. The agenda is a way of grouping items into categories according to subject. Agenda categories are named and arranged by the conference organiser. Maintaining an up to date agenda is important so participants can retrieve previously seen information easily and select items to be viewed for the first time.

The AGENDA command works for the organizer the same as the ORGANIZE command works for the other participants.

There are two strategies for organizing the agenda. One is to create categories at the beginning of the conference and to put items into them as they are entered. The other is to create categories and group items as the conference grows.

Conference stimulation. In addition to the technical upkeep of the conference, the organizer has additional morale-boosting responsibilities. From past conferences we have found that some participants need encouragement to become active in a conference. Some people may feel slightly intimidated by the computer, or be put off by the lack of face-to-face contact. They may enter only formal, well thought-out items, or nothing at all.

get participants to use the conference as a forum to throw out ideas, to discuss, to disagree, and to express feelings.

As the organizer, you have an opportunity to set the tone for the conference. A relaxed, friendly tone in your messages and items can serve as a model for other participants. Prompt, friendly responses to questions, complaints, and messages will encourage participation. To encourage conferees to get to know other, you might suggest (in the welcoming message or opening item) that each participant enter an item about his/herself and his/her interest in the conference. Then set an example by entering one about yourself.

vote on items if they wish, using the VOTE command.

The organizer of a long-lasting conference should periodically update the welcoming message. This message can be used to capsulize and summarize the conference for late joiners. This message can be updated as the conference proceeds to contain any or all of the following : a summary of the discussion, instructions for sending items to the high-speed printer, instructions for using the agenda, and a list of especially relevant items.

Another tactic is to enter periodically summary items on topics of discussion. These items can be grouped into one agenda category. The welcoming message should contain a pointer to this special agenda category.

Sperry Univac

Suggestions for maintaining lengthy conferences. Conferences which last for a long period of time (say, several months) and accumulate many items require some special consideration by the organizer. Participants who register into a conference with many items are overwhelmed by the mass of data. They don't know what has been discussed, what is being discussed, or what is current. This problem can be handled in several ways.

Late joiners should be aware that they can send all items to the high speed printer. Instructions for doing this appear in « The User's Guide to CONFER II». After getting the print-out of the conference they can read the conference leisurely without wasting computer time and money. Later, they can

Another approach to this problem is to close down the old conference files and start a new conference with the same or a different name. The organizer can compose as opening items summaries of the previous conference. The old agenda, participants list, items, and votes would all be lost. However, alt this can be sent to the highspeed printer and made available to those who want to view it. The advantage of this approach is that it cuts down file space needed for storage of many old items. The disadvantage is that on-line availability of the historical development of the conference is lost. Before restarting your conference, all participants should be instructed to destroy their local files.

Checking participation. If a participant is inactive, you may want to phone or

meet with her / him to find out if s / he is having difficulties with the conference. If so, offer assistance.
If a person decides to drop out of the conference, you should withdraw his/ her name from the participant lists in the master and vote tiles, so that others will not expect participation from her/ him, (Withdrawing a participant's name is discussed in « EDITING THE FILES »).

Use of messages. Besides sending prompt, friendly replies to participants, you can stimulate participation with the use of messages. When a participant first joins a conference (CONFER will notify you), send him/her a message to let him/her know s/he has some unique contribution to make to the discussion. (S/he will get the welcoming message from you automatically, but this will be more personal). Messages can also be sent to persons who are especially suited to respond to a particular item to encourage them to do so.
Often you will find that you will receive messages from a conferee which would be of interest to others in the conference. Messages of this sort can be turned into items (with permission of the author) for all to see and comment on. Turning messages into items is detailed in « The User's Guide to CONFER II ».
Ethical considerations. The organizer should be aware of ethical problems which may arise using this novel manner of communication. In general, the author of an item is the owner of that idea. Conference communications should not be quoted or reproduced in other media without permission. Someone may want to turn a private message into a public item. Or someone may wish to extract an idea generated in the conference for use outside the conference. In each case it is best to get permission of the author. Perhaps the best guideline is to treat each conference message as a private memo and each item as a semi-public statement. What permission you need to extend the use of such material may depend on your relationship with the author.

Closing the conference. When you decide to close the conference, you should inform the participants (via ITEMS and NOTICES) beforehand. You should edit the source file to contain a statement of the closing of the conference that will be displayed if someone tries to join after the conference closes. You must also edit into the source file some MTS commands which will cause this notice to be displayed. You must also change the permit status and instruct conferees how to destroy their conference files. Instructions for these steps appear in « EDITING THE FILES « section of this Guide,

III : TECHNICAL INFORMATION

Part A : Organization of conference files

Central Level Files
Conferences are organized into three files for shared business : !he master, vote, and source files. Bob Parnes will create the central level files once you have obtained the resources. Files particular to each participant are created when a participant registers into a conference.

THE MASTER FILE contains a master participant list (on which sign on and off times are not up to date), all items and their references, descriptors, and text. This file is expanded automatically as new items and participants enter the conference. It should be edited by the organizer only with caution.
The master file is divided into three regions :
-- 1: This region contains the items.
2 : This region contains the number at which the vote is set. When the conference is set up. the vote threshold will be set at one. You may change it at any time.
-- 3 : This contains the participant list.
The participant list consists of the participants' names, message file names, and times of registration.
THE VOTE FILE contains the voles (or each item, an up - to - date participant list (which current sign on times), and the current brief notices of all participants. The vote file is divided into three regions :
-- 1: This region contains a participant list identical to the one in the master file except sign on times are current and brief notices are kept here.
-- 2 : This region contains author agenda information.

--3 : The organizer can close the vote on an item by editing information into the integer line.

THE SOURCE FILE is the file with which the
— 1 : Do not edit this region.
— 2 : This contains the « welcoming message » which is automatically transmitted when a new participant registers into the conference. When your conference is set up a standard message will appear here. You should change it to reflect the interests of your conference.
-- 3 : The introductory message which appears each time a conferee signs on is taken from these lines. In addition to confirm the topic of the conference, an alert to newly posted notices may be given here. This section, too, will contain a standard message when the conference is created, but it can be changed by the organizer at any time.
— 4 : This contains the closing message. This can be changed at any time by the organizer.
-- 5 : This region contains notices posted by the organizer,
6 : The notice of the closing of the conference is placed here on the date of the closing.
— 7 : if usage statistics are being collected, the name of the monitor file appears here.
8 : Under no circumstances should this region be edited.
-- 9 : This region contains the agenda. This region should not be edited. It should be changed only with the AGENDA command.

PARTICIPANT FILES
Each participant has a local file and a message file which are created when she/he registers into a conference.

THE LOCAL FILE contains Information which is particular to his/her activity in the conference (voting, lime/date of usage). It should not be edited.
Each participant has a MESSAGE FILE lor messages and reminders. Editing is not suggested.

Part B : Permit Status for Participants

Permit status (or access) refers to the kind of authorization a person has to use a file. The conference organizer determines the permit status for the rest of the participants . There are three types of status used within the CONFER software:
— 1. Read (R) status permits a person to read but not change a file. Conferees have R status to the source file.
— 2. Read write (RW) status lets a person and / or program add to and change (edit) a file.
The organizer must have RW access to the master and source files. The CONFER program has RW access to the conference files.
-- 3 : Unlimited (U) access means that a person can read, add to, edit and destroy a file. The ID on which a conference is created has U status to the conference files.

When a file is created, it is automatically closed to everyone except the owner of the ID on which it was created . The owner can give others permit status to use the file. Once the conference has been created you must appropriately permit the master, vote and source files so that others can participate.

Part C : Editing the Files

Editing the central level files should be done only when absolutely necessary. Mistakes in editing the file can seriously disrupt the conference by introducing mistaken action of CONFER as well as changing or deleting substance.
It is necessary that most editing be done on a terminal with upper and lower case capability.
Editing the participant list. It may some limes be necessary to change a participant's phone number or message file name. This should be done in both the master and vote files.
Editing an item. If an author requests that you change an item, be sure it really needs changing. Ask the participant to UPDATE the item, it may save confusion for other conferees.
Withdrawing an item. An item should be withdrawn only when absolutely necessary. This should not be necessary often because CONFER has some built-in precautions for keeping out items which are mistakenly entered.
Withdrawing participants. You may need to suppress a name from appearing on the list of participants because s / he has withdrawn from the conference.

Posting notices. Notices are edited into region 5 of the source file which allows the most recently posted notices to bo printed out first. Obsolete notices may bo deleted or left in the file.

Closing out a conference. Before closing a conference, you should post a notice as a warning to participants.

Unesco-Nairobi-Paris via Symphonie

Une grande première des téléconférences par satellite

par E. Lloyd Sommerlad*

*Reproduit avec permission du * Courier * de l'*Unesco, *avril 1977. Un rapport technique détaillé de l'expérience est disponible à l'Unesco sous le titre : A Unesco Tele-Conference Experiment. Paris, Unesco, 1977 (novembre).*
Il faut bien faire la distinction entre une télé-conférence qui se limite a des échanges audio-visuelles continues entre des endroits éloignés et l'utilisation à l'aide d'ordinateur d'un stockage des messages pour faciliter la communication dans un réseau de participants en contact discontinu.

Les télécommunications sont désormais en mesure de se substituer, le cas échéant, au voyage. Il ne sera plus nécessaire, pour tenir une conférence internationale, de déplacer les équipes de travail, voire les participants eux-mêmes.

La première expérience à grande échelle en matière de - téléconférence » a été couronnée de succès; elle a été réalisée grâce au satellite qui assurait la liaison entre le Siège de l'Unesco, à Paris, et la 19e Conférence générale de l'Unesco réunie au Kenyatta Center, à Nairobi, en octobre et novembre 1976. A l'étonnement des délégués et du Secrétariat, et en dépit de certaines difficultés d'organisation, ta Conférence (la première qui se soit tenue hors siège au cours de ces vingt dernières années) a travaillé de manière aussi efficace et rapide que si elle avait eu lieu à Paris. Ce qui eut été impossible sans le satellite. Pendant toute sa durée — cinq semaines — la liaison instantanée permit à la Conférence de communiquer directement de Nairobi à 6.400 km de là, avec l'Unesco. à Paris.

(*) Lloyd Sommerlad, chef par intérim de la Division de la libre circulation de reformation et des politiques de la communication, est responsable du programme de l'Unesco sur l'utilisation des communications spatiales pour l'éducation et le développement. Il a été coordinateur général des liaisons établies par satellite entre te siège de l'Unesco à Paris et la Conférence générale à Nairobi (octobre-novembre 1976).

Les gouvernements de France et de République fédérale d'Allemagne qui,' depuis 1967, avaient mis en œuvre « Symphonie », système expérimental de communication par satellite, en laissaient la disposition à l'Unesco pour la Conférence, fournissant le matériel et les techniciens nécessaires. Lancé en 1975, le satellite est placé sur orbite géostationnaire, à 36.000 km d'altitude, et garde la même position avec la terre au cours de sa rotation. Il est couramment employé à diverses expériences, techniques, scientifiques ou éducatives.

Une petite station au sol pourvue d'une antenne de quatre mètres et demi de diamètre était installée sur les lieux de la Conférence, à Nairobi, et entrait en service quelques jours avant l'ouverture de la Conférence. A l'autre extrémité du circuit, c'est-à-dire au siège de l'Unesco, les signaux radio étaient transmis à l'antenne de Pleumeur-Bodou, en Bretagne (à 600 km de Paris) et de là, au satellite.

La téléconférence visait précisément à :

- déterminer jusqu'à quel point l'emploi d'une liaison par satellite permettait au Secrétariat de l'Unesco et aux délégations permanentes demeurés à Paris d'être directement associés aux travaux de la Conférence et de contribuer à leur bonne marche.
- évaluer l'utilité des diverses commodités techniques du satellite (téléphone, télex, fac-similé, transmission des données, radiophonie et visiophonie) dans le fonctionnement des divers services de la Conférence (information, documentation, traduction, interprétation, procès-verbaux, etc.), comme dans l'établissement des comptes rendus des travaux de la Conférence par voie de presse et d'émissions radiodiffusées.
- estimer dans quelle mesure le maintien au Siège de certaines équipes de travail pourrait être désormais possible lors d'ultérieures Conférences hors siège. L'une des fonctions majeures de Symphonie était de relier à Paris les délibérations des trois commissions travaillant simultanément à Nairobi. Le programme de la Conférence était chaque jour transmis à Paris par fac-similé, et un système de télévision en circuit fermé, au Siège, indiquait le lieu et l'heure des diverses réunions.

Les membres du Secrétariat, les délégués et les journalistes pouvaient ainsi choisir la Conférence qui les intéressait et suivre les débats, soit en français, soit en anglais. Le matériel transmis par ces six canaux radio était distribué à plus d'une centaine de bureaux, au Siège même, par un système de communication interne. Autre caractéristique importante de cette entreprise : la souplesse des divers modes de communication instantanée dont on disposait : six lignes téléphoniques, quatre circuits télex et deux machines à fac-similé à Paris comme à Nairobi.

La machine à fac-similé, dont l'emploi est appelé à se multiplier à l'avenir dans les conférences, peut transmettre en quelque trois minutes une page dactylographiée, ou imprimée, ou des tableaux et des diagrammes. Pendant la Conférence, 4 000 pages environ ont été transmises de ou vers Nairobi. Elles comprenaient le Journal quotidien de la Conférence, des documents, des textes de discours et des rapports.

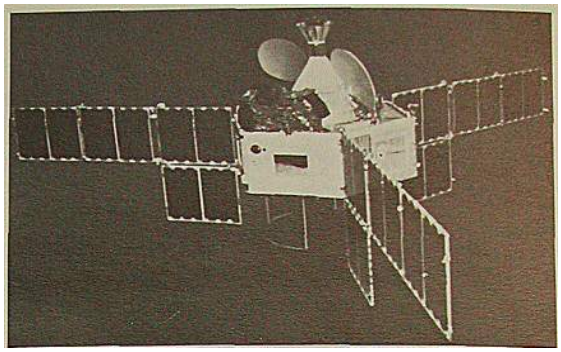
Fut expérimenté également un processus de traduction : des textes originaux, en arabe ou en chinois, par exemple, étaient transmis en facsimile à Paris, où ils étaient traduits en d'autres langues, puis retransmis en fac-similé à Nairobi. Il apparut donc que les traducteurs pourraient rester au Siège de l'Unesco lors des conférences

hors siège qui auraient lieu ultérieurement.

Pendant les cinq semaines que dura la Conférence de Nairobi, plus de 2 000 appels téléphoniques et de 1 500 messages télex furent échangés par satellite.

Deux, des circuits du satellite étaient réservés à une expérimentation par ordinateur, A Nairobi, un terminal relié à l'ordinateur installé au Siège de l'Unesco permettait de disposer de la documentation et des données administratives mémorisées par l'ordinateur, A toute question était ainsi apportée une réponse immédiate, dans tous les domaines relevant de la compétence de l'Unesco.

Une liaison radio permanente entre les studios de Paris et de Nairobi assurait la transmission des programmes établis à Nairobi et devant être copiés et distribués à Paris. Elle permettait aussi un enregistrement direct et la publication des discours d'un intérêt de premier plan prononcés pendant les réunions plénières à Nairobi, de même que la liaison de divers débats entre groupes de travail à Paris et Nairobi. Plus étonnante encore se révéla la visiophonie, utilisée une heure par jour, heure pendant laquelle toute autre forme de communication était interrompue, la petite antenne de Nairobi n'étant pas assez puissante pour cumuler toutes les liaisons radio. Tant à Nairobi qu'à Paris, les studios étaient équipés de « contrôleurs », petits écrans de télévision reliés par le satellite qui assuraient des entretiens face-à-face, transmettant à la fois



Maquette du Satellite « Symphonie . Centre spatial de Toulouse » , France.

l'image et le son. Une série de conférences de presse fut organisée en visiophonie, ainsi que des discussions entre diverses personnalités, et des tables rondes.

La visiophonie offrit aussi l'occasion d'essayer l'interprétation simultanée à distance. Si ce fut une réussite sur la plan technique, les interprètes témoignèrent plus tard de quelque réticence; i! était gênant pour eux, dirent-ils, de ne pas voir la salle, ni la personne qui parlait, dans la mesure où un certain « contact » facilite l'interprétation simultanée.

Les diverses performances de Symphonie firent donc la preuve de l'utilité des télécommunications directes sur grande échelle, dans le travail de conférences géographiquement lointaines.

Ce n'est là qu'un début. Les améliorations techniques, les finesses d'organisation qui ne manqueront pas d'intervenir encore autoriseront à relier, non deux points du globe seulement, mais plusieurs, aux fins de « téléconférences » qui n'exigeront plus de déplacement. A une époque où les frais de voyage et de transports sont très élevés, les télécommunications entraîneront de sérieuses économies. •

Maison de L'Unesco, conférence de presse en visiophonie Paris-Nairobi.

On-line intellectual communities

by Manfred Kochen *

This paper was originally prepared to introduce a symposium at the annual meeting of the Society for General Systems Research (Denver 1977} on the subject of (« On-line intellectual communities » , namely associations of scholars whose interaction was primarily via computer terminals linked via computer networks. (References cited wilt be found in the bibliography on page 448).

Introduction

The notion of an on-line intellectual community began to capture the imagination of scientists in the early sixties. The kind of system envisaged in 1965 for 1975 is compared with what did take place, and an image for 1985 is sketched. It focuses on the promise of computer conferencing. « Peopleware » aspects of this technology, in parallel with hardware and software, are stressed as the major determinants for realizing its potential, within realistic constraints. This potential may be to amplify the intellectual capabilities of individuals by orders of magnitude if entirely new modes of collaborative problem-solving emerge. This paper introduces several substantive papers that sample important new-ideas and results related to computer conferencing, and these provide a fair indication of what may come in the future.

Early visions

According to Carl J. Overhage and R. Joyce Harman (1965; see also Kochen, 1967), « the online intellectual community » was a fragmentary dream in a very few minds around 1960. By 1965, project INTREX at MIT had begun to demonstrate an operational version. The 1965 Intrex book visualized an information transfer system al MIT in 1975. It claimed to be « mindful of the universal tendency to overestimate what can be done in a single year, and to underestimate what can be done in ten ». It projected time-sharing. It was envisaged to be half-way in the transition from the technical library to a system offering completely on-line retrieval of scientific and technical information.

It was also expected to process retrieved data, display the results in user-oriented forms, and allow user-oriented control of the system. It was expected to be an augmented catalog, to include table of contents, abstracts, citations, including the use of touchtone with voice answer back, selective dissemination services and new publishing patterns.

Communication networks tying together university systems were forecast. How much of this vision has come to pass ? A good overview of computer conferencing was written in 1974 (Macon, 1974; Day, 1964; Kupperman and Goldman, 1974; Turoff, 1974) and a more comprehensive and current discussion was produced by Linstone and Turoff (1975). Computer conferencing is seen as the least known member of a family of teleconferencing systems. In 1976 it appears to be the development with the greatest promise, and most of the discussions to follow focus on that. It is defined as « the use of shared computer files, remote terminal equipment, and telecommunications networks to facilitate group communication where face-to-face contact is either not possible or less desirable ». Teleconferencing means communication to surmount barriers of space and time (people need not communicate simultaneously but have their inputs stored and forwarded). It includes telecommunications, which means more or less simultaneous interaction between two persons at different locations. In computer conferencing all inputs are stored in one file from which they can be retrieved in various ways. It also allows the user to edit all his inputs. Both real time and delayed communication is possible. Numerous computer conferences have been organized or designed on a great variety of topics.

* *Mental Health Research Institute, University of Michigan.*

and a great deal is being learned from the successes and failures.

Current situation

Some aspects of the Overhage-Harman 1965 forecast have been surpassed. Others have not. Unforeseen events have occurred. Most importantly a new vision has taken the place of the older one. Until 1976, the climate for research and development in the creation of novel forms of networks were favorable. In 1976, networks and on-line intellectual communities were an operational reality to some extent, but in most quarters expectations for further development are considerably more modest. In this note we present a more hopeful image than is usually encountered. It is probably also more realistic.

Time-sharing is widespread today, and used to the point that users often cannot get a free entry port. For example, it is easier to enter the Michigan time-sharing system via the MERIT network in mid-afternoon, when a busy signal is more than likely. Minicomputers, which now do what large-scale computers did a decade ago, are used for time-sharing, and are also widely used in computer nets.

The availability of billions of characters' worth of bibliographic data for on-line searching with a new data base being added every two months, has been heralded as a technological triumph in 1974. But on-line information or data retrieval is far from widespread. To be sure, there exist very useful data-retrieval systems such as MICRO and sophisticated ones such as SPIRES, but they are not yet widely used.

Display technologies and graphic data processing, has gone far, but it is not widespread either. The work by Engelbart and others at Stanford Research Institute has gone far beyond the augmented catalog but it is still only a handful of organizations, at best, that can avail themselves of these advances.

Several university systems are interconnected, but not as many as attempted by Educom, and experimentation with new publishing patterns is underway, with some progress toward the notion of an editorial processing center. Voice-answer back with touchtone telephone is a reality and its potential for widespread use is as great as its practical use is not widespread.

In sum, the purely technological aspects of the 1965 vision did come to pass and were surpassed in many ways. Microcomputers, due to large-scale integration, have had an unexpected impact that is only just beginning. The number of computer hobbyists has mushroomed as rapidly and suddenly as the number of citizen band radio operators. Costs of voice synthesizers. devices to transform a home TV set into a computer terminal, microprocessors, etc.. have plummeted dramatically. Computer conferencing, first used to help a group of people reach a joint decision, has become a reality with considerable potential. Several networks, Including the commercial TYNMET and TELENET, are starting to be widely used because of the usage ease, low cost and growing number of users connected to them, Well over a million computer terminals were in use in 1976.

Inadequate « peopleware »

While we have the necessary technology for on-line intellectual communities, it cannot be claimed beyond doubt that many such communities exist and function significantly. Technology — both hardware and software — is necessary but not sufficient. The major barrier seems to be lack of adequate « peopleware ». This long neglected aspect is just now being identified as a major determinant of success. To be sure, specialized computer scientists and others who have taken the trouble to become proficient in the use of computer systems and networks and to retain their fluency by constant practice, have indeed formed nuclei of on-line intellectual communities. The SUMEX-AIM project headed by J. Lederberg at Stanford University, and S. Amarel at Rutgers is an excellent example. So is the use of telecommunications with computerized store and forward capabilities that were used by President-Elect Carter's campaign aides. Some of the ARPANET users have been such a community for some time. Exceptional enterpreneurial, organizational and managerial capabilities of key people seem to bo the primary determinants of successes that have been attained.

Computer scientists have only recently begun to become concerned with meeting the needs of those potential users who would neither take the time or effort to become much more skilled in computer use than in using a telephone or driving a car, nor to use the system often enough to maintain fluency. There is a vast and important group of such users. It includes professionals in every field, policy-makers and concerned citizens. Computer scientists who now pride themselves on designing software that is « friendly » have still a very long way to go. Many still tend to think of the computer as an expensive, powerful instrument that only specially trained people should use; it is not intended for playful or casual use by amateurs. An on-line community can behave intellectually, however, only when the technique of being on-line is secondary and instrumental to the content and form of community interaction. For example, the sign-on procedure is still far too complex for many users, and users should not be expected to burden their memory with numerous special keys for backspacing, terminating messages, etc. They need on-line orientation to the various systems, languages, data bases that are available to them, guidance in which to use when, and far more detailed on-line prompting, instruction, help and diagnostics in entering the appropriate input just at the time they must generate those inputs. They sometimes need to be able to use several languages or systems simultaneously, switching from one system

INBEL

to another without signing off one and

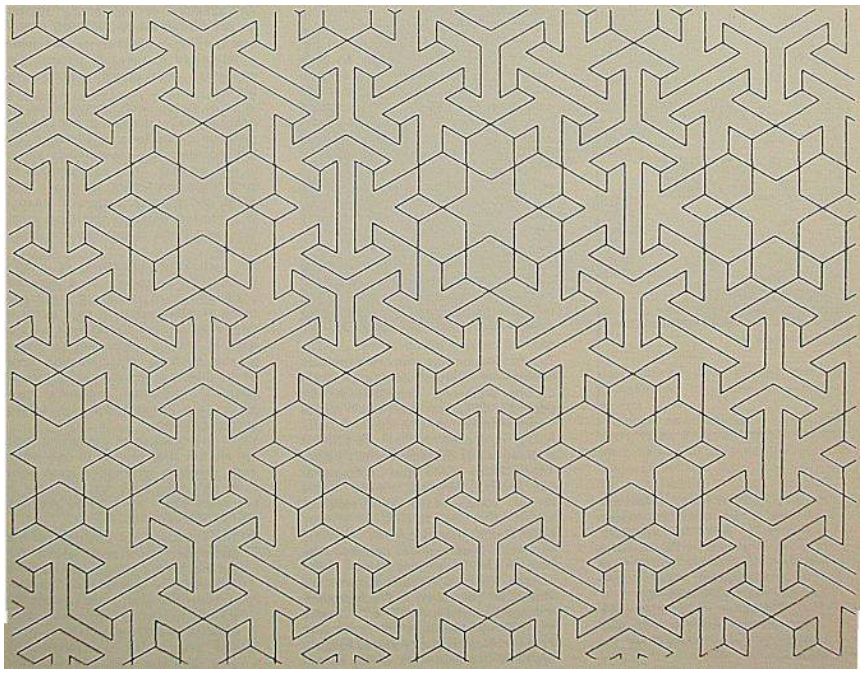
while signed on to a computer conference in co-authoring a scientific paper may wish to retrieve some data using a data retrieval language, and immediately perform a statistical analysis on the retrieved data using a statistical language and insert his findings into an appropriate place of the joint paper.

The above is, however, only the minor part of the needed « peopleware ». The major part is the know-how to get a pair of potential co-authors to actually use the system. To be sure, it must be easier for them to do their joint work with the system than without it. But that still may not be useful enough. When we speak of an ideal on-line intellectual community we really refer to new communities, that would not exist or function without the on-line technologies. If there are. for example, potential co-authors in that community, the hardware, software and peopleware of this technology must actualize this potential. The role of the peopleware component is to motivate the potential co-authors to initiate and maintain

the interests of all parlies. Identifying the various interests and values of individuals with great sensitivity and spotting and exploiting genuine commonalities is the heart of peopleware. It is basically a problem in the intersection of social psychology, communication science, sociology and organization theory. These problems are quite difficult, but there is reason to hope that they will be better understood as a result of the experiences with computer conferences and networks now being reported by a greater number and variety of users.

The future

We can now envision on-line intellectual communities of 1986 to amplify by one, perhaps several, orders of magnitude the intellectual work now done by an individual. Specialization seems to have reached a point of diminishing returns. The results of specialized contributions can be brought to bear on solving significant problems only with increasing difficulty and enormous efforts at synthesis. Yet, unless intellectuals continue to specialize further, they will be overwhelmed by the masses of relevant knowledge they feel compelled to keep up with. A natural method of combining the labors and results of specialists, somewhat as pieces of a jigsaw puzzle fit together, may offer some hope in this dilemma. Significant problems requiring the cooperating and coordinating efforts of several specialists may be resolved, and the number of such problems that are solved or successfully coped with may be 10 or even 100 times the number of such problems that are identified and coped with now. Constructive criticism would improve problem-solving quality by affecting sooner and with more effect. It may be, in a decade, as if the individual members of an intellectual community were as neuronal components and the online community as a nervous system with some brain-like properties (Kochen, 1975).



Computer-facilitated informal organizations

*Extracts from the program announcement for operational trials funded by the US. National Science Foundation **

Introduction

The National Science Foundation supports the operation and development by the New Jersey Institute of Technology of a test facility for research on electronic information exchange (EIE). and will entertain proposals to test various forms of EIE within small, well defined research communities (**). These research communities are conceived as groups of 10 to 50 individuals sharing an interest in a scientific or technological problem area. Any scientific or engineering discipline can be represented. A proposal may be submitted on behalf of such a community by an institution acting as the community's agent. Members of the research communities selected will be able to use the test facility's resources to exchange written messages, participate in computer-managed conferences, and publish finished work in electronic form. Each will have a personal notebook « space » in computer memory for material that is being developed and edited. They will be able to employ the test facility's resources in their pursuit of established lines of inquiry or to focus on a community-wide research task. At the conclusion of their trial project they will be expected to publish their assessment of the impact which EIE has had on their effectiveness. The Foundation has supported projects directed to a systematic exploration of one promising alternative to the paper-based system upon which formal communication in science and technology now depends. This « electronic alternative » is described briefly below. The facilities of the electronic alternative are not, however, limited to the formal communication of research results after the fashion of primary publications, libraries, and indexing services. Those facilities can also support a variety of less formal interactions within a research community. One such interaction is the computer-managed conference, first employed in 1970 by the Office of Emergency Preparedness and subsequently by many organizations in a wide variety of settings. The subject of a burgeoning literature, it is under active investigation in several of the Foundation's programs and by a number of other Federal agencies.

Small Research Communities

These are conceived as groups of 10 to 50 individuals sharing an interest in a scientific or technological problem area. This may be an established field of specialization, an emerging field of research, or an interdisciplinary field. Any scientific or engineering discipline can be represented in such a community. The Foundation is particularly interested in research communities concerned with urgent national problems.

In most cases such communities are geographically dispersed and heterogeneous in institutional affiliation, but the members are nevertheless known to one another. They communicate by such means as letters, telephone, preprints and reprints, reciprocal citation in published works, professional meetings, and items in journals and newsletters.

To participate effectively in a trial project, the members of a research community must recognize the importance of communication as a factor in their effectiveness and share a willingness to try the electronic alternative to the methods of interaction upon which they are accustomed to rely. In addition, individual members must accept the responsibility for certain special functions.

While the problem of organizing itself for an EIE trial project is one which each research community must solve in its own way, there are a number of key roles which have to be provided for in one form or another,

- The moderator, or chairman of the community conference, should ordinarily be the individual whom the Foundation recognizes as the project director and holds responsible for the overall direction and coordination of the trial project.
- The coordinator, a secretary or aide to whom individual members

* *Program Announcement : Operational trials of Electronic Information Exchange (or small research communities. Washington DC, National Science Foundation. Division of Science Information, Access Improvement Program (NSF 76-45).*

** *The Electronic Information Exchange System (EIES) is briefly described on pages 431-433 of this issue.*

of the community can look for immediate assistance on any problems which may arise in their use of the test facility's resources, should ordinarily be under the direct supervision of the moderator.

* The editor is the member of the community who receives electronic « manuscripts », screens them, refers them to other members for evaluation, and ultimately accepts or rejects them for publication through the test facility. As articulator and interpreter of the community's editorial standards, he must be an individual of recognized scholarship who enjoys the confidence of the community.

• The assessor is the member designated by the community to lead in its assessment of EIE. If the community chooses to establish a committee for this purpose, he could serve as its chairman. It is to this individual that the moderator will look for documentation of that assessment in publishable form.

Many other roles are possible — e.g., ombudsman, devil's advocate, gadfly. Research communities are encouraged to organize themselves as they see fit, so long as they provide in some way for the functions of the key roles.

The « electronic alternative »

The ultimate goal of any system for scientific and technical communication is to enhance its users' productivity. The value of information is that its use can increase the productivity of its user in whatever he seeks to do. While many human activities can be carried on with a very limited input of information, their output is likely to be inferior in quantity or quality to what otherwise would have been possible. Nevertheless, information which is hard to get or awkward to use is likely to go unused, even at a sacrifice in productivity. And if it does get used, the costs of access and use may still be so great as to offset any resulting gains. Before new information can be put to use, it must be captured from its originators in a usable form. It must then be distributed to potential users. A shift to electronic methods would attack obstacles to the productive use of information in each of these phases of the communication cycle.

Capturing New Information

Information cannot be considered truly accessible until it has been made a part of the public record. That record comprises the published literature, compilations of factual data, and other primary materials. It also includes secondary information, which is used to identify and locate sources of directly useful information.

Publication. The world's store of scientific and technical literature continues its exponential growth, with a corresponding diversification of the uses to which can be put. We may be nearing the limits of what can be accomplished by printing, mailing, storing, and retrieving pieces of paper, if we are, effective communication will necessarily come to depend upon electronic means of handling information. In any case, for significant improvements in the accessibility and usefulness of the information handled we must look beyond paper-based communications to a computer-sensible literature, stored in central facilities for instantaneous presentation at remote terminals anywhere. To create such a literature through the conversion of printed literature would be slow, inefficient, and formidably expensive. For this reason, a goal for publication is to capture new

essential, intellectual functions. Its computer-sensible output can be used to set type for conventional publication. Alternatively, that output can itself serve as the public record of scientific accomplishment.

Data Banking. Data, the factual results of scientific observation and measurement, can be made accessible to potential users in the same way as the published literature. They must be critically evaluated and then compiled in computer-sensible files. These in turn must be accessible by means of terminals at remote stations. An essential condition, clearly, is the standardization of the files and their contents. But any large-scale program to convert dissimilar compilations to canonical form would be costly, time consuming, and wasteful. As in the case of publication, therefore, a goal for

Bell laboratories, USA

literature in computer-sensible form at its source.

To some extent this is being done today. A computer-sensible record is created as a by-product whenever a computer is used to set manuscripts in type for conventional publication. Such innovations as the Editorial Processing Centers or EPC (see Editorial Processing Centers : Feasibility and Promise, Rockville, MD : Aspen Systems Corporation, 1975), are expected to bring this technology within reach of the smallest journal publisher. Essentially, an EPC is a communication center for authors, editors, and referees. By relieving these people of all clerical functions related to publication it frees them to perform their

data banking is to capture new data compilations in usable form at their source.

Although data banking is widely practiced today, the practice is uncoordinated. The resulting files are relatively inaccessible, and many potentially useful compilations are not captured at all. Public data capture centers could accept evaluated data from diverse sources, much as an EPC accepts manuscripts. Provided only that the data were adequately specified by those submitting them, the centers could automatically effect all necessary transformations, such as conversion to metric units. The uniform files thereby created could be used to set numerical tables in type, a matter of some econo-

mic significance. More important, those files could join the computer-sensible literature as a part of the public record, instantly accessible to users wherever there are terminals. Abstracting and Indexing. Timely and dependable analysts of new information is necessary if the information is to be incorporated into the body of organized knowledge. The abstracting and indexing services of the various disciplines have traditionally performed this function for the published literature. Over the past decade the Foundation has invested heavily in their computerization. As a result, the computer-sensible files of secondary information which they create as by-products can now be used at remote terminals to identify sources of useful information.

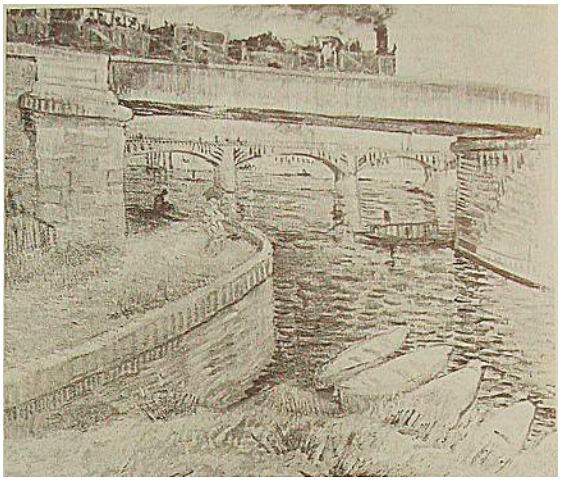
Distributing Information for Use

Information is accessible to the degree that it can be retrieved whenever it would be useful. It is useful if, having been found, it can be used productively. Distribution for use, then, requires access to the sources of information, a means of searching for information which can be used, and further means of putting what is found to productive use.

Access to the Public Record. Computer-sensible literature, data compilations, and files of secondary information may be held by their originators, transferred directly to users, or both. They may also be collected by information distributors, such as libraries. It is unlikely, however, that any single institution will be able to assemble a complete collection of such materials and keep it up to date. A goal for computer-sensible information resources is to share them through a network of their holders.

By sharing their resources, the abstracting and indexing services can avoid duplication of effort. As the originators of those resources (e.g., EPC's) join the network, they can use its facilities to transfer their products. already in computer-sensible form, to the abstracting and indexing services for processing. Through steps like these an operating environment can be created for distributors of computer-sensible information. But such cooperation will only become possible as the participants achieve mutual compatibility in their intellectual analyses, bibliographical practices, computer operations, quality standards, and operational dependability.

Finding Useful Information. Useful information takes such forms as sentences, numbers, and graphic presentations, selected from the vast array of similar items which would not be useful. To find them the user needs more than access to the public record.



Van Gogh : The Bridge of Chatou.

He needs a means of searching it for documents and files likely to contain information which he can use, and within selected sources for the information itself. It is clearly impractical for each potential user of information to acquire an exclusive capability for doing these things. A goal for information searching is to provide the needed capability through remote terminals which individuals can use at their places of work. Such capabilities exist today for identifying and locating sources of information likely to be of use. Given an information resource network, it should be possible to offer, in addition, the capability of searching within the computer-sensible sources selected. The same facilities could be employed to announce newly recorded information in specified fields — information which could then be retrieved at the user's convenience. The process of electronic publication which begins in a EPC would thus be completed through the electronic analog of a journal subscription. But the communication process need not end there. The same facilities could also be employed for less formal exchanges of information in computer-managed conferences, which have recently been found to have great value for group problem solving and for the coordination of activities.

Productive Use of Information. Information is usually sought for use in reaching a decision, gaining an understanding, solving a problem or generating new information. In doing these things, the user may interact in a variety of ways with the information he has found, depending on his current needs and interests, his past experience in the use of information, and his individual temperament. Many of these models of behavior involve functions which could be performed better and faster by a computer. To relieve the user of such functions would increase the effective usefulness of this information or, equivalently, augment his effective intellect. A goal for information use is to provide computer assistance through the same terminal as is employed to acquire information. Instead of underlying passages or writing in the margins of documents, a user could enter notes into computer-sensible files, with the computer keeping track of his sources and assuring the correct use of quotation marks. He could use such a file to accumulate his own * manuscript * as he drafts it — adding, deleting, and rearranging material at the touch of a finger, and relying on the computer to format his finished work according to any specified standard. He might call for assistance in the preparation of engineering drawings; in the interpretation of tabular, graphic, or sentential materials; in statistical analysis; or in the construction and exercise of mathematical models, Many of the necessary capabilities already exist, usually in some specialized form, and there is at least one major test facility for their experimental study.

Assisting « Invisible Colleges » by EIES

by Murray Turoff, James Whitescarver
and Starr Roxanne Hiltz*

The Electronic Information Exchange System (EIES) has been developed at the New Jersey Institute of Technology under sponsorship of the Division of Science Information of the National Science Foundation of the USA. The specific objective of EIES is to facilitate the communication and exchange of information among various small scientific or technical groups prior to format publication of the results of their work together. EIES is, therefore, a specific computerized conferencing system design structured to aid small scientific groups or « invisible colleges ».

(*) This article is extracted, with the permission of the authors, from a paper entitled : The human-machine interface in a computerized conferencing environment.

EIES, as a computerized conferencing system, represents an integrated mix of a specific communications structure and various data processing capabilities formulated to facilitate or aid the communication process of a particular human endeavor. In this case the human groups of concern consist of ten to fifty individuals working at the forefront of some technical or scientific area who desire to exchange recent research findings in an informal manner and discuss various issues, objectives, methodological concerns, etc. associated with their specialty. The problem of the interface design is best perceived by characterizing the types of users that EIES must serve. Some examples of these are :

1. A researcher who has never used a computer before.
2. A researcher who has never used a computer before and who could not care less about understanding computers and anything more than is necessary to accomplish some specific task.
3. A researcher who is sophisticated with respect to use and knowledge of computers and who expects a high degree of leverage in interaction with the machine.
4. An intermediate acting for the primary user such as a secretary, student, assistant, aid, spouse, child or others who may not have the same abilities as the intended user.
5. Individuals in any of the above categories having various strong feelings about computers such as fear, distrust, contempt, worship, over respect, etc.
6. Individuals in any of the above categories who have little spare time to waste on anything that is not immediately useful to them.

Thus there emerges at least four separate dimensions by which one can establish a classification schema or morphology for the users of EIES, and probably of most other general use interactive computer systems as well :

1. Degree of interest in the System or Computers
2. Degree of Computer sophistication or understanding
3. Degree of intelligence or general education
4. Degree of available time and related expectation on utility.

Depending upon the mix and characteristics of these parameters for an individual user and the actual interface design, we must be concerned with the following types of user attitudes and emotions that can result from a mismatch of the above parameters and the interface design :

fear, boredom, confusion, timidness,
frustration, embarrassment, impatience,
tension, pressure, disinterest, distrust, etc.

The result of this is the classic paradox that has always faced interactive systems : The design dilemma of how to appear to be all things to all people.

General « Design » Principles for EIES

The underlying premises of the design are :

Forgiveness

The emphasis here is on there being no error the user can make from his terminal which causes a serious consequence, a loss of control over what is being done, produces an irrevocable action on the part of the system, or causes more than a simple repeating of the in-

put in error. Typical examples are having to re-enter a large amount of material because of one error, not being able to revoke an action, unintentionally leaving the interlace, etc. This is largely accomplished by a separate and distinct software package that acts as a transponder between the system and user and may be instructed by the system as to what are appropriate error actions. This also allows a high degree of « bullet proofing » to be performed on the user inputs. By encouraging the user to experiment and try things s the is unsure of, one obtains the added benefit of conditioning the user to learn things by trial and error. In addition, one can potentially remove the fears neophytes often have about breaking a very expensive machine or causing themselves all sorts of penalties for not doing something exactly right.

Segmentation

This is the ability of the user to learn only a minimum number of things in order to be able to accomplish a specific task. This is important for the new user who should very quickly get useful results out of the system and for the more sophisticated person who does not have the time to devote to learning a brand new computer system. The problem, that always arises here is that the user should not be brought to the point of viewing the total system as N separate and distinct systems lest s /he loose sight of the forest for the trees. EIES is laid out in a total framework that relates to concepts the user is familiar with, and once that is understood the user is free to investigate the particular electronic version of that concept s/he wishes to make use of. Unbeknownst to the beginning user, once one of the segments of the system is learned most of the operations applied to that particular concept are exactly the same for other segments of the system, so that learning more of the total system represents a minimum effort in the absorption of new information.

Variety

In order to satisfy the wide variety of backgrounds for potential users of EIES there are actually four different modes of interaction available. These are the standard « menu selection », « command driven » , « command streams » and - procedures ». In other words a user can choose to be led by the hand, memorize a set of commonly used commands, develop his or her own commands comprised out of any sequence of menu choices and existing commands, or design a seemingly different interface for personal use or by others. Furthermore, these are not distinct in the sense of an either / or situation, since the user is free to combine the use of these various interaction modes as seen fit.

Escape

The ability to escape from any action or change one's mind about what is taking place. At the elementary level this is just proper use of the « break » key, but at the more subtle level this involves insuring that the user has at any time both the information to make an intelligent decision about whether the action should continue, and the opportunity to negate it. For example, when the user enters a short identification number to indicate that an action for an item in the system should take place, the action will not be finalized before the title of the item is presented and a confirmation is requested from the user. In a search or printout the user is informed of how much to expect before results are delivered.

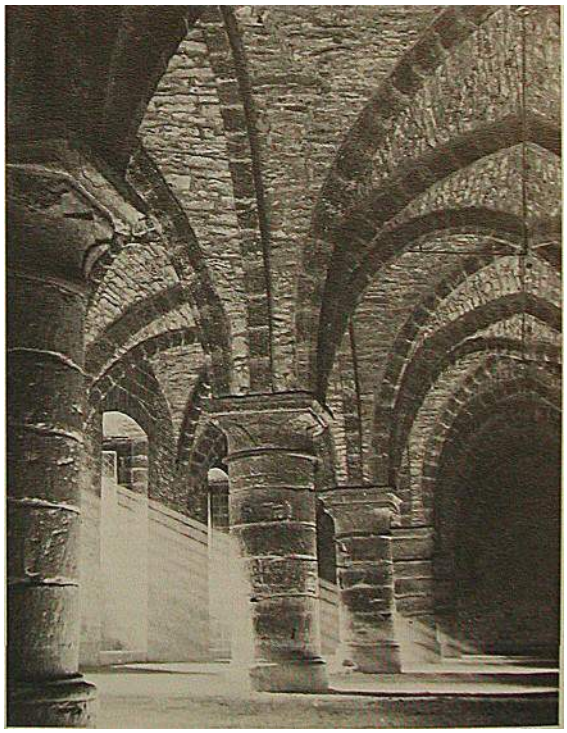
Guidance

The ability for the user to obtain just enough information on-line to be able to accomplish some new type of action; and the segmentation of this information, from a very short statement (or the more experienced computer type to the longer explanation required by the beginner.

Leverage

The ability to provide features that are flexible enough and powerful enough to be useful and interesting to the individual who would like to take the fullest possible advantage of what the computer has to offer for the facilitation of human communication. Many capabilities that are common to computer systems today are provided such as program writing capability, analyses and modeling potentials. However, these are designed in as subordinates to the human communication process of the system. This opens the door for facilitation of group and team efforts by the computer, rather than augmentation of one individual, which is the principle that underlies most interactive systems today.

INBEL



EIES Components

The system is presented in a set of digestible chunks which are at least analogous to things the user is already familiar with. We present these in the order the new user would probably learn them in terms of actually making use of them.

Members and Groups
Every member of EIES is listed in the directory and can be retrieved in a variety of ways; partial names, key words in descriptions, zipcodes, etc. Also listed and described are groups, which are a collection of members who have some common interest, purpose or objective. Each group has a human coordinator who is a general secretary and aid for members of the group.

Messages

Any member may send a message to any other member, to a specific set of members, or to a whole group to which the member belongs. When another member has received a message, a confirmation of delivery is automatically generated.

Scratchpad

This is the place a member goes to actually write a page of text for use as a message or for any other purpose possible in the system. The user's personal scratchpad is permanently stored so that one does not have to complete an item at one time.

User Consultants

Special members who are there to answer questions about the system and may be messaged by members for help and aid.

The above beginning concepts and the very minimal operation of sending a message is all the user needs to know to get started and into communication with his/her peers and those who can provide help.

Conferences

The conference is a stored discussion common to a specific set of members, in which everything is automatically provided to the other members when they enter the conference, and the proceedings may be reorganized and reviewed at will. There are Group Conferences associated with a particular group, private conferences for a set of members not constituting an official group, and public conferences available to any member of EIES.

Conference Moderator
The Moderator of a conference is analogous to a meeting chairman and has the power to reorganize the association of comments and to edit or delete any of the material. Authors can do the same with the material they have authored. However, the degree of authority the moderator may exercise is really up to the sociology of the particular group and the norms it establishes for itself.

Notebook

This is a private file and writing space for an individual member, who may choose to invite others in to read sections or write in sections of the notebook for either reviewing or co-authoring. Material developed in the notebook may be used elsewhere in the system and materials developed elsewhere may be filed away in the notebook. There are also public notebooks which anyone can read, but which have a specified set of members who are allowed to write in them.

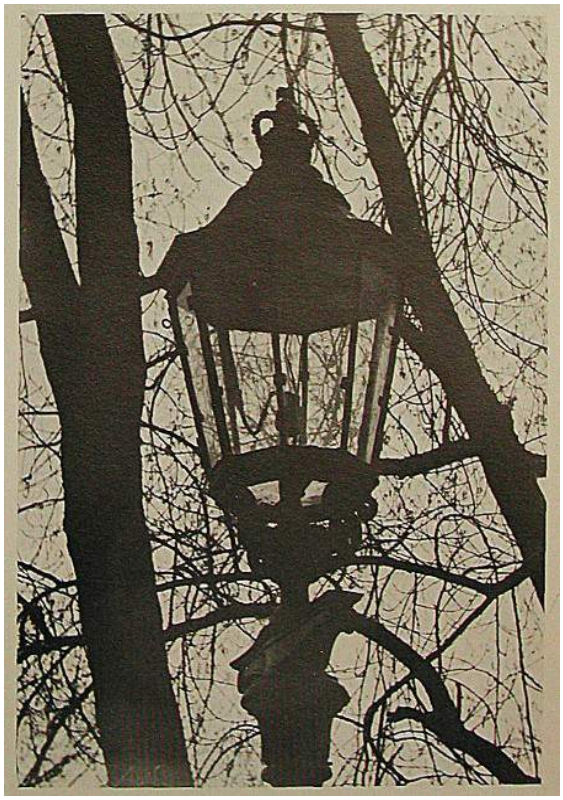
Bulletins

Bulletins are associated with a specific group and represent a place to publish material. The Bulletin has a section on News another on Assessments (which are votable items and comments on them) and a section on short reports of recent research findings.

Bulletin Editor

The human editor of the bulletin decides what gets published and may organize temporary review conferences between authors and reviewers. In this review process, as in any item entered into EIES, the members may sign their comments as « anonymous » or with a pen name.

R. Bridger



Computer conferencing and productivity in science

Linton C. Freeman*

The « crisis » in communication

There are stages in the history of any human organization when the key to its growth and development or even its survival is regular and rapid communication. Typically, these stages occur at times of transition when its goals, options, strategies and even its organizational form are subject to discussion and debate. At such times discussion is necessary to generate ideas, air conflicts, explore alternatives and develop policies and plans out of the consenses of involved persons.

For organizations that are concentrated entirely in one particular locale, such communication demands can be met by arranging frequent meetings and conferences. For organizations that are large and geographically dispersed, however, arrangement for regular communication among interested parties may be a good deal more difficult. Similarly, the process of forming new organizations, particularly if they are nationwide or worldwide, raises special communications problems.

Fields of scientific study are, in the context of this discussion, just like any other kind of organization. If a field is well established, what Kuhn (1970) has called a « normal » field of science, its practitioners can get on with their day-to-day activities of generating knowledge. Such a field has consenses. Its initiates agree upon its goals, standards, procedures and norms, and too much communication simply interferes with getting the job done.

But when a field is in a state of « revolution » when its norms are changing, or when it is newly emerging and developing norms, rapid regular communication is absolutely essential to its progress. And again, like other organizations, if its members are many and spread out over vast geographic areas, problems of arranging such communication loom large.

Of course, in any organization — scientific or otherwise — most problems can be solved with enough money. The need for regular and rapid communication can be solved by moving all the interested parties to a common locale — either frequently, but temporarily, for meetings and conferences — or more or less permanently as a condition of their employment.

During the fat days of the 1950s and 1960s American scientists were frequently moved from one university to another in the interest of building a « critical mass » of scholars interested in a particular problem. Those who did not move and even some who did seemed, however, to spend most of their days during that period in some other locale attending some meeting or other. Those were good days and many new specialties and new perspectives on old problems emerged.

Today, however, our belts have been tightened. Universities have seemingly gone out of the employment business altogether and hardly anyone is able to finance frequent national or international conferences anymore. The development of new fields of scientific study and the engineering of revolutionary changes in established fields have become difficult enterprises. Much of the creative part of science-building has ground to a halt.

Computer conferencing

Recent developments in communication and computer technologies can now provide an economically attractive alternative to face-to-face conferencing in such situations. It is called computer conferencing. It involves the use of a computer to facilitate the communication among the members of a group of participants. Each participant types notes or messages on a terminal located in his or her home or office. Messages are routed over phone lines and stored and / or passed on to their targets by the computer. Such a system, then, aids in the composition and transmission of ideas and information among a large number of participants.

A number of computer conferencing systems are currently up and running (Johansen, Vallée, Spangler and Shirts, 1977). Among these, the Electronic Information Exchange (E.I.E.) system at New Jersey Institute of Technology (Turoff, 1977} is designed specifically to provide the sort of service to scientists that is needed by those working on the kinds of problems that require rapid and regular communication.

Example : social networks

A number of experimental trials of the E.I.E. system using various communities of scientists is currently in the planning stage. Among these, one is designed specifically to explore the use of computer confereing to facilitate communication in an emerging field of science. Forty social scientists who are interested in the study of social networks will be communicating regularly by means of a computer for the period of one year.

The networks perspective is engaging the attention of social scientists throughout the world. Major centers are developing in Britain, the United States. Canada, Germany, Holland and the Scandanavian countries, and small groups or individuals are working in .France, Israel, Japan, Korea, Australia, Mexico and some South American countries as well. These social scientists represent the disciplines of anthropology, communications science, human geography, information science, applied mathematics, political science, social psychology and sociology. Notwithstanding the heterogeneity in their backgrounds, they are all beginning to recognize a common interest in the study of social networks. They are increasingly concerned with the forms or structures of the social relations that link persons together into networks and with the processes through which such networks emerge, evolve and exhibit consequences for human behavior. The facilitation of rapid regular communication among interested participants is of signal importance for the development of the study of social networks. Currently, communication among students of social networks is slow, expensive, difficult, often hapha-

* *Department of Social Relations, Lehigh University, Bethlehem, Pennsylvania,*

zard and frequently restricted to small subsets of colleagues who happen to bo geographically proximate or previously established as collaborators within a traditional discipline. Individual productivity, therefore, suffers and contributions to the collective effort are

The project will start with a one-day face-to-face conference in Bethlehem, Pennsylvania, among all participants. The conference will be oriented toward planning for the evaluation of electronic information exchange on scientific growth. It will include the outside evaluators and will set the stage for ongoing project evaluation throughout the course of the experiment.

This initial, pre-electronic conference has three purposes :

(1) It is designed to provide the kind of interpersonal ambiance that can lead to easy and full participation on the part of all who are involved. As Hiltz and Turoff (n.d.) have indicated, it is difficult for persons who have not met face-to-face to get to know one another well enough to relax and participate in a computer conference without undue formality. Since we are involving a heterogenous set of participants, not all of whom are personally acquainted, it would be useful to start with an initial experience that could provide a basis for easy informal communication and later collective efforts.

(2) This initial conference is designed to provide an explicit group goal. This set of participants is uniquely qualified to make significant contributions to the solution of that problem. The computer conference is, itself, a social network. Moreover, interest in networks of scientists is widespread among the participants; it is, therefore,, a natural subject for a collective effort. It can form a basis for group cohesiveness and provide a set of evaluation procedures that may turn out to be useful for other scientific communities as well,

(3) It affords a natural setting for initial exposure to the computer system. The members of the networks community who lack experience with consoles can be initially exposed with the help of their more experienced colleagues. They can be guided through their first trials and supported in such a way as to minimize any initial anxieties.

At the conclusion of this conference each participant will be encouraged to share a sample of his or her current work on social networks with the others. This initial set of papers will be made available to each participant over the computer network, forming the basis for an initial community wide computer-based conference. These papers will acquaint each participant with how the others think and what they are thinking

Scanlicon Hojbjerg

about, providing an opportunity for participants to sort one another out and to form working sub-groups according to substantive interests and styles. The formation of sub-group conferences will, of course, be encouraged. In addition to facilitating communication among participating scientists, the conferencing system at New Jersey Institute of Technology can be adapted to permit the sharing of data and procedures for data analysis. This sort of exchange can be extremely important in an emerging field. Often, for example, when a new concept or hypothesis is developed existing data could be used to provide at least an initial test of its utility. In such a case collecting new data is not economical. Among social networks investigators, the current practice involves searching the literature for a person who has appropriate data, phoning or writing for permission to use them, sending a tape through the mail, copying the data to tape and reproducing the code book and sending these materials back through the mail. This is a costly procedure — both in time and in money.

As an alternative, in the context of our experiment with electronic information exchange, the following procedures will be used. Anyone with a large coded data set on his or her home computer will be encouraged to make it available to other participants. Those who agree will provide the project monitor with a codebook and appropriate documentation on access. A computer at the New Jersey Institute of Technology will be programmed to copy appropriate data into the files of any participant who request them. From the viewpoint of the participant who needs data then, the computer intermediary is simply another participant who is eager to share his or her data. Information about available data will be provided and, on demand, data transfers will be made overnight.

Similar procedures can be used for accessing computer programs for data analysis. Programs for manipulating the large matrices frequently encountered in the study of social networks are expensive to produce. Such an investment is inappropriate if needed programs already exist elsewhere. So again, to the degree that participants are willing to share their programs the computer intermediary can be programmed to act as an access device for available computer programs. Thus a participant with data could send a message to the computer intermediary calling for a particular analytic procedure to be applied to his or her data. In 24 hours or less he or she would receive a message from the intermediary that included the analytic results.

Thus, appropriate programs will be developed to permit access to data or analysis programs by any participant. The New Jersey Institute of Technology has a computer that is prepared to play the sort of intermediary role envisioned here (Turoff, 1977).

Conclusion

In summary, the potential impact of the system of electronic information exchange on the social networks community is very great. Students of networks-are currently at a critical point in their development as a community. Their members are geographically dispersed and are grounded in a large number of traditional disciplines. Moreover, they are only recently aware of the several traditions they represent.

(suite voir page 445 / continued on page 445).

Computer conferencing issues

by Murray Turoff and Starr Roxanne Hiltz*

1 : The threat of premature regulation of computer conferencing **

The first policy problem may, on the surface, appear trivial to those of us who are technocrats. It is the problem of the name of this beast we are discussing. In the literature we find such alternatives as :

- — Computerized Conferencing (CC)
- — Computer Mediated Interaction (CMI)
- — Computer Based Conferencing (CBC)
- — Electronic Information Exchange (EIE)
- — Computer Assisted Teleconferencing (CAT)
- — Computer Mediated Teleconferencing (CMT)
- — Teleprocessing (TP)
- — Electronic Mail (EM)
- — Computer Communications (CC)

In addition to the general names we also have a host of special names applied to specific systems : Emisari, Partyline, Discussion, Conference, Forum Planet, CMI, EIES, CONFAB, MAILBOX, CONFER, etc.

The result is confusion on what is being talked about. This is par for the course in terms of a professional area that is newly developing. However, because; the area is one that has a large commercial potential in the near future some real problems are produced by the use of names.

This is no small issue in the minds of those who may not understand some of the fine design and technical distinctions we can employ to attempt to justify one or more of these alternatives. Consider, for example, the image each name might conjure up for a legislator or a lawyer working in a regulatory body or some particular company in either the computer or the communications industry. The use of the prefix « tele » immediately presumes in many minds that this is to be an animal treated exactly like we treat the phone system. A name like electronic mail automatically limits the perception of what the technology is really capable of doing. The word « computer » provokes antagonistic reactions on the part of a suprisingly large number of people these days.

In many discussions on this form of communications individuals get wrapped up in the terminology problem.

This phenomenon is symptomatic of a desire to define such systems as either a computer system or as a communication system. If this can be done then we apparently believe we will know how to handle it and all problems with it will miraculously disappear. It is the legal fallacy that the question is one of definition. While this is the common approach, it highlights why we have problems with effective regulation. People are able by this preoccupation with definition to sidestep the real issue : that is, that the objective and purpose of regulating is promoting the « public good ». What debates in this area should really be about is the degree to which the public interest is served by either regulation or non-regulation; and if regulation is needed, are the current regulatory mechanisms and laws really appropriate to this situation ?

To fully grasp the policy implications of computerized conferencing one must take care neither to view this area too narrowly nor to make the mistake of viewing it on a strictly relative basis compared to other communication alternatives. Traditionally there are two basic approaches to Justifying a computer development.

1. To show that what you have been doing can be done cheaper or in greater volume or more accurately.
2. To do something you have never been able to do before.

The first approach is the common way that one justifies the development of a computer system. Usually the second method is too difficult to utilize as a justification process because a great many people have a problem in perceiving things that have not been done before and must conceptualize it in terms of what is being done now. However, most of the major impacts of computer systems, and particulary the unanticipated ones, derive from computers being able to do things we could not do before.

The specific issues that arise in the U.S. are very different from many other countries that have historically decided that communications are to be rigorously regulated or under government ownership. By such policies, it is our view that many of these countries may place themselves in disadvantageous positions in terms of the benefits offered by this technology. Some of the issues now evident in the U.S. are :

1. Is the regulatory model of these services the single phone or mail system, and is this model still an effective one even for phones or mail?
2. Are new regulatory mechanisms needed to deal with computerized services in general ?
3. If computerized conferencing is interpreted as a communication service under the laws governing the FCC, does this mean the right of censorship provided under the legislation will also apply ?
4. Should we view this medium as one for business, or take a view that it must be made available in the future to the average citizen ?
5. What about communication of this type integrated into EFT (Electronic Funds Transfer) for bid and barter, stock and commodity exchanges ? Who are the regulators now ?

Because of the huge potential for « public good » that these systems provide, a review of regulatory policies in many areas is needed. In a sense other computer applications have already stimulated this controversy in terms of actions now taking place in the regulatory, executive and legislative bodies in the U.S.

Computer Mediated Communications

Whenever a useful new technology is developed, one policy question which should be vigorously pursued is how to make it available to those who cannot afford to buy it themselves. We believe a key area that is not yet incorporated in the current debates is the possibility of public use and the resulting benefits. Besides such things as work at home options and the resulting savings in energy from the usa of

* Dr *Turoff is Associate Professor of Computer Science and Director of the Computerized Conferencing Center, New Jersey Institute of Technology, 323 High Street, Newark, NJ 07102, USA. Professor Hiltz is Chairperson, Department of Sociology and Anthrology, Upsala College, East Orange, NJ 07019.*

** *This article consists of extracts, selected by the editors with the permission of the authors, from a paper entitled : Computerized conferencing; a review and statement of issues (Presented to the NATO Telecommunications Symposium, Bergamo, Italy, September 1977). Many of the points made in the paper grow out of a computerized conference devoted to a research review sponsored by the National Science Foundation,*

information services integrated into C.C. systems, one obvious area is the benefits for the disadvantaged in our society.

At first glance, the advent of computer-mediated communications systems would seem to be just one more technological factor which will be used only by the well educated and well-to-do in the overdeveloped nations, who are ready with the skills and the money to take advantage of the opportunities they offer. However, like Sesame Street on U.S. educational television (another high-cost, high technology medium), an enlightened and purposeful public program might be designed to make the new communications medium serve the disadvantaged rather than compound their disadvantages.

For example, a computerized conferencing system, accessed through portable terminals that can be used in the home or even in a prison ceil, and including a CAI component, can be used to bring education, counseling, peer support, and job opportunities to the mobility-limited aged, the physically or mentally handicapped, or prisoners. (See Hiltz and Turoff, 1976, for a full discussion of this issue). Taking the physically handicapped child in the U.S. as an example of possible applications for computerized conferencing systems, there are many special terminal interface devices which enable almost any type of physically handicapped person to write and read from a computer terminal. However, unless funds and encouragement are allocated to such applications by governments, such non-profit applications of computerized conferencing systems are not likely to develop.

We believe that the right of access of citizens to such systems will be necessary for the public good, and the manner in which a citizen is able to function in a free society will be dependent on that access. In effect the citizen will need the same ability to access information systems as he now has to access the telephone system. Currently, for example, the pricing structures on computer systems and digital networks often cater only to organizational users by imposing volume minimums. The rather weak enforcement of interface standards further inhibits the possibilities for citizen users.

The key question of regulation comes down to whether or not your national post office will make available one conference system with only one design, and prohibit other conference systems including the use of those based in other nations. If the automobile industry had been regulated in this manner, it might still be true that consumers could have any kind of car they wanted, as long as it was black, started with a crank, did not travel over 30 miles an hour and was not used for any international travel.

Summary

At the moment this is an area that should be open to the widest range of investigation and experimentation with the greatest possible incentives to encourage individuals and organizations of all types to be involved. These systems should evolve in such a manner that users have the greatest opportunity to pick and choose from alternative services. There is not the knowledge in existence today, nor will there be for a long time to come, to design systems that could be considered to be the « best ». Nor is there any need to since the implementation of a computerized conferencing system involves only a software system sitting in a single computer. It can be completely divorced from the issues associated with establishing a common communication network providing service for the common good, Such a network can have hundreds of alternative computerized conferencing systems in many different computers satisfying the requirements of many different human groups with differing needs and problems, in terms of the public good there is no justification for artificially limiting the diversity of computerized conferencing and communication systems until we have a great deal more knowledge about the possible applications and impacts of such systems.

We believe that existing computerized conferencing systems resemble the future possibilities in this area as much as the Wright Brothers' little biplane resembles the jumbo jet. However if premature regulation limits the development and assessment of wide range of alternative designs and applications, the technology may never get off of the ground.

The specific points that we would like to emphasize are the following :

- The most important impacts will result from new types of applications, rather than from mere substitution for existing communications.
- There is an almost unlimited range of capabilities and applications for Computer-structured human communication systems.
- Current names may be inadvertently producing incorrect images of these systems for policy and decision makers. There is considerable danger of mistakenly initiating policy and decision making based upon the characteristics of existing, simple systems.
- What is needed now is a period of innovation, proliferation, experimentation and assessment, during which maximum incentives operate to create a diversity of available sys-

2: Impacts of computer conferencing upon organizational styles *

* *This article consists of extracts, selected by the editors with the permission of the authors, from a paper entitled ;*

« *Potential impacts of computer conferencing upon managerial and organizational styles* » ,

One : Further Decentralization of Corporate Structures

If you change the communications structure of an organization, you inevitably change also the nature of the decision-making process within it and the kinds of decisions that are likely to result. The growth of today's dominant business organizational form, the multi-national corporation, would not have been possible without the world-wide linkage of corporate outposts to the Home Office by fast and pervasive communications lines.

By contrast, computerized conferencing can facilitate the decentralization of information exchange and decision-making.

Executives who adapt to the new communications toot might find that they can become much better informed and

better able to concentrate on long term plans rather than day to day problems. Computerized conferencing allows the lateral coordination and accountability necessary tor decentralization of authority with a speed and efficiency not. possible with other communication systems. Ongoing transcripts of all conferences among middle managers permits monitoring and / or intervention if an unwise decision seems imminent.

Two : Potential Advantages of Remote Meetings by Computer Conference

Computer-mediated communication systems are not meant to totally replace all other communication forms. Executives and managers will still use the telephone, personal meetings, and letters for some purposes. However, the system, if wisely used, should cut down markedly on the amount of travel and personal meetings which are necessary, and help make those face-to-face meetings which are held more productive by establishing a common information base ahead of time. In addition, the computerized conference may be more efficient than face-to-face meetings for sharing information, eliciting points of view, and facilitating decision making. Many dysfunctional things occur in face-to-face decision making meetings. First of all, one or two people tend to dominate the discussion. This dominance is aided by several factors :

1. Only one person can «speak» at once; others are reduced to the passive condition of being an audience.
2. Persons with high rank are deferred to; persons with low-status but irrelevant characteristics such as being black, female, or strange-looking have their contributions devalued.
3. The quieter or, less active participants tend to - tune out » by thinking about or doing other things. These participants stop participating, in fact, unless called upon, and sit there fidgeting while waiting for the meeting to end.
4. It has been observed in laboratory experiments that verbally dominant individuals tend to reinforce their dominance with aggressive nonverbal mannerisms which intimidate the others (pointing, leaning toward the person or group, etc.).
5. « Jet lag » means that persons who travelled *a* long distance to the conference are not able to function well.
6. The press of schedules means that a meeting cannot go on for more than three hours, without a break for meals. Sometimes important matters get little consideration because they are brought up late in the meeting,

These (actors would not be operative in computerized conferencing. The fact that one person is typing in an entry does not prevent some or all of the others from typing in their entries simultaneously. Ranks and characteristics irrelevant to competence or expertise in the task at hand are less likely to influence the discussion. There is much more likelihood that more people will actively participate, that more points of view will be expressed, and that the ideas will be judged on merit, rather than by their origin. There is no tyranny of the creeping clock; participants may join and leave the discussion at their own convenience, and it may go on for days or even weeks before closure has to be reached. In addition, because reading speed is much faster than listening to the spoken word, it is possible to exchange many more ideas in the same amount of working time.

On the other hand, there are disadvantages. For instance, some people find it easier to refuse to answer messages sent over these systems than to ignore a telephone call. Since there is generally no particular hour which must be set aside for participating in asynchronous conferences (those in which the participants are not all on-line simultaneously), some people never seem to get around to participating much at all. Without the richness of non-verbal cues, there is a greater chance that the meaning of a communication will be misinterpreted. While the discussion in a computerized conference may generate more ideas and better decisions than a face-to-face meeting, it is possible that the social cohesion necessary for effective implementation of those ideas by the group may not develop without face-to-face contact. (See Hiltz 1976, and Johansen, et. al., 1977, for a more complete discussion of disadvantages).

Three : Implications for Alternative Organizational Structures

The structure of a computerized conferencing system can be adapted to fit whatever form or type of organization exists. One typology of organizational forms, for instance, has been summarized by Dodd Bogart (1973) as « feudal », » bureaucratic », « human » and « systems ». Let us examine the central characteristics of these four types of organizational structures and the implications which computerized conferencing might have for each of them,

1. « Feudal » (or authoritarian) organizations :
Place an emphasis on the individual leader and on hierarchy, with influence and Ideas flowing downward from the leader at the top, and the loyal followers expected to obey without question Most procedures follow tradition; the organization acts in ways that have proven to work well in the past until (ho leader acquires a new insight or ambition. The « feudal » leader could use the computerized conferencing system simply as a cheaper and faster way of gathering information, options, and advice from trusted followers, and then of disseminating his decisions and orders.

2. « Bureaucratic » :
First analyzed by the 19th Century sociologist Max Weber, this form emphasizes the rational distribution of responsibilities among positions or offices, with formal rules and procedures governing all actions. In principle, any qualified person can fill any position, as symbolized by the organizational chart and job description manuals. The rules and procedures are oriented towards achieving reliability of performance; reducing uncertainty; and maximizing productivity and efficiency as measured by fairly short-term profits.

In the bureaucratic organization, a « legitimate » application might be for inter-departmental discussion of issues that do not clearly fall within the domain of any one department or of existing rules and procedures. However, computerized conferencing is more likely to be used to subvert the bureaucracy. Bureaucratic organizations are like a stale block of Swiss cheese : a structure of rigid rules, but full of holes in the rules and regulations. Crafty bureaucrats can learn to find these * holes » and work around the formal structure to accomplish specific objectives. Often this is the only way significant change comes about in bureaucratic environments. With computerized conferencing, the potential would be increased for a group of motivated individuals to form and work in concert through private messages to find the appropriate way to circumvent the usual regulations and procedures; this of course would have a devastating effect on the organization — (the cheese would begin to crumble) — but perhaps a desirable one in terms of accomplishment.

3. The « Human » organizations :
.Most fully described by management theorist Rensis Likert; places the emphasis upon small groups, rather than on the. individual or position, as the locus of communication, influence, and decision making. The manager should direct his attention toward facilitating group cohesion and group participation and toward acting as a communication link to other groups, in order to maximize both group performance and individual self-actualization through group contributions.

There is no better mechanism for allowing the computer conferencing group leader to stay abrest of all the processes and projects with in his own group and to simultaneously keep in constant contact with other group leaders and developments at other locations in the organization. However, the availability of computerized conferencing might encourage the humanistic approach to be carried to the extreme, where group task accomplishment is replaced by group therapy. The heightened sense of « real » communication with others can become addictive in nature and seem an end in itself, causing the group to lose contact with the rest of the world.

4. The organizational « System » model :

Symbolized by mathematical models and the flow diagram featuring a feedback loop. Information, influence, individuals, and resources (money, production facilities, etc.) are seen as dynamic variables which may be allocated and reallocated to various functions and problems in order to maximize the organization's ability to deal with a changing environment (the macro-system of which the organization is a part) and with changing priorities over a long term.

A computer-mediated communications system makes the system approach much more feasible for a large organization. It allows the organizational leaders to draw upon large amounts of data and upon models that are stored in any computer, and to structure decision-making and task groups on an ever-changing basis in order to respond to changing conditions.

In « *Beyond Bureaucracy* », Warren Bennis predicts that such a system-oriented organizational form will become necessary in the future, based upon « adaptive », problem-solving, temporary systems of diverse specialists in an organic flux. But how can this be reconciled with the increasing resistance of executives and their families to endless transfers from one geographic location to another? The NJIT research group believes that computerized conferencing would allow complex team projects where the members are geographically dispersed.

Project management conferences would provide a complete written record of all specifications, changes, clarifications, and suggestions that took place, in addition to providing complete accountability if ever needed. It would also have a significant impact on the manger's ability to regulate his own time, and to be fully involved in more than one task force at once. On EIES, it is up to the user to choose when he or she wishes to review the new items and make contributions, rather than being a slave to the ringing telephone and the meeting scheduled at someone else's convenience.

Four : Text Processing and the Middle Manager : You Can't Get Good Office Help Anymore

There will still be good secretaries, or administrative assistants; but these will generally be well paid, highly skilled college graduates, both male and female, whose duties, rank, and pay will mean that only top executives will have a « private secretary ».

It is likely that many a middle manager, after weeks of being frustrated by slow and inaccurate typing from the clerical pool, will decide that maybe using a text-processing system and doing much of his own work is far less frustrating. With the notebook and editing facilities of EIES, a person can produce and send presentable letters, memos, articles, etc., without a secretary. In addition, much of the traditional « filing » function is done electronically.

Five : Other Possible Applications

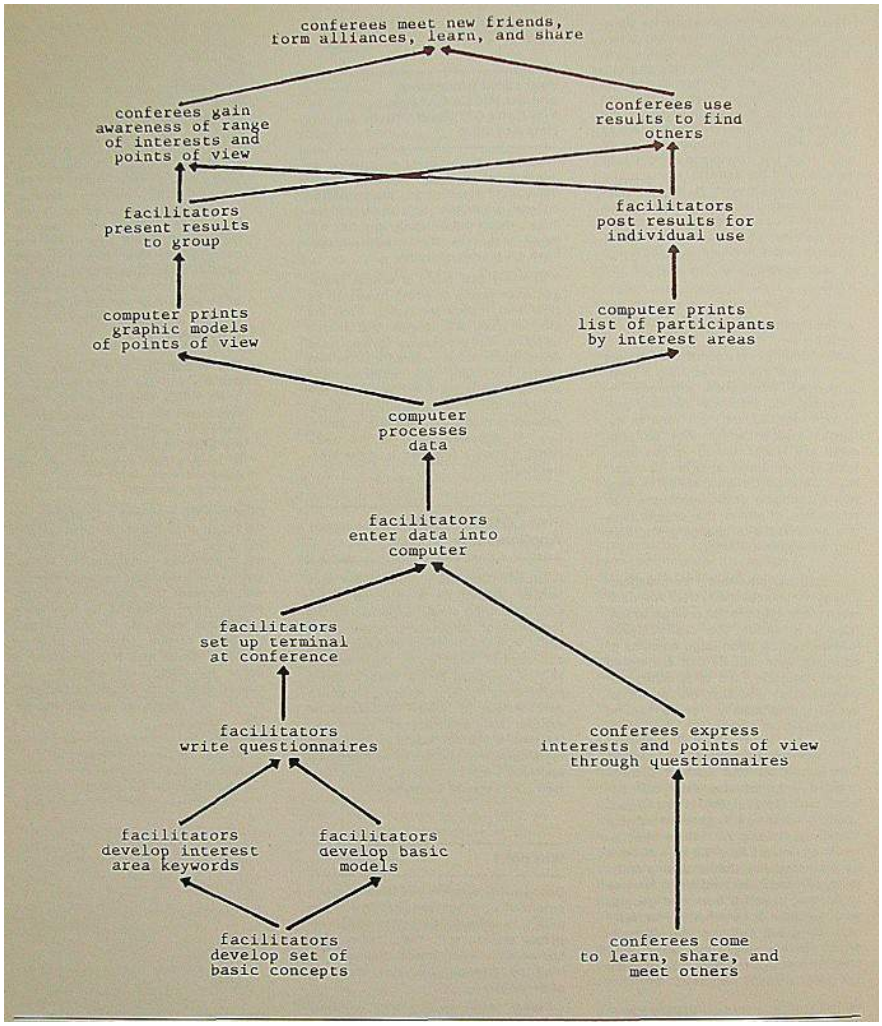
Boards of Directors could become more heavily utilized as a resource which would contribute real expertise to the formation of corporate policies, especially with the diversity of background and outlook common to the membership of a typical board. Rather than a perfunctory monthly meeting in which participation is limited to superficial debate and unstructured comments, the board member would have time to think about the matters to be discussed and feed back comments by computerized conferencing beforehand.

Why not ?

Despite the benefits ascribed to computerized conferencing, we do not expect it to immediately saturate the corporate environment. There are a number of significant factors that will inhibit its growth. The most important of these are :

1. Most of the people who currently design, « sell », and utilize « management information systems » are committed to the data base / model approach. There is no recognition, even in our university courses on such subjects, that the management information process is primarily a communication process. To compound the problem, there is a reluctance .in any organization to view communications as a problem at all or to perceive that one can do something about it that does not revolve around the psychology of specific individuals. This is further complicated by the fact that it is difficult for individuals to actualy understand the possibilities offered by a new form of communication until they can experience it.
2. There is a natural and probably justifiable aversion to computers on the part of those managers who are guided by . intuitive » approaches to management action. It will take some education for them to realize that this is one of the few computer systems that can lend support to intuitive and judgmental approaches by widening the range of intuition that can be brought to bear in a coherent manner on a given issue.
3. The availability of terminals, particularly for use in the privacy of one's office and home. This item represents the major capital investment and would be hard to justify on the basis of this application alone. in today's cost conscious environment.

Despite such problems with gaining initial acceptance, the use of these systems will grow. Sometime in the late 1980's, we hypothesize, computerized conferencing and associated message systems will represent the major use of computers, when measured by how many individuals make use of any available computer service. Once the price of terminals drops to S 500 (projected to occur by 1980), the economy and convenience of this form of communication will make its growth inevitable. .



Oregon I & R idea fair and workshops
May 17-18, 1977

Help in crisis
Referral services
Follow through
Information services
Escort services
More publicity
Social networks
Social act. advocacy
Emergency aid
Maintain client data
Up to date service info
Make appts for clients
Other existing services
Outreach services
Teaching info skills
Legal advocacy

The following variables are available in the I & R model file :

Inform folks of rights
Sharing services info
Uniform client data
Joint case planning
State-wide toll free "
Clearinghouse
24-hour I & R
Kind of agency
Other possibilities
Sharing client info
Planning using data
Multi-service centers
Widespread info access
State-wide network
Other improvements
Green pages

Conference facilitation by computer-aided sharing

by Peter and Trudy Johnson-Lenz *

People who attend conferences, meetings, and workshops come to team or to express themselves about a particular topic or issue. But each person brings to the gathering an individual, private view or mental model *of the topic or issue. During the course of the session, an individual's mental model of the topic may change or stay the same. If individuals' models of the topic can be made explicit and shared in a simple, easily understood form, then the participants can find out more about how others think and how many people attending hold various points of view. This can promote greater understanding and empathy among participants. It can also lead to discussions of differences, dialogues, and the formation of coalitions of people with similar views, if desired.*

Furthermore, it participants are able to find others in attendance with simitar areas of interest, they can share common concerns and experiences with each other at the conference and even form alliances for action and support afterwards. Since people also attend conferences in order to meet and talk with other people, knowing which other participants share one's own interests can greatly facilitate sharing. This paper describes some techniques for computer-aided sharing of participants' mental models and interest areas. These methods were used at the second Oregon Information and Referral Idea Fair and Workshops, held May 17-18, 1977 in Salem, Oregon. The Fair was attended primarily by information and referral people in human and social services agencies and programs. To illustrate these methods of conference facilitation, examples of information and referral models and keyword interest areas are included.

Further information may be obtained from the authors at : 695 Fifth Street, Lake Oswego, Oregon 97034, USA.

The people who came to the second Oregon Information and Referral Idea Fair and Workshops (May 1977) work for many different kinds of organizations, from public welfare to cooperative food stores to community action agencies to legal aid. Since their experiences with (and models of) information and referral (I&R) varied so much, and since the Idea Fair was a conference devoted t new ideas and approaches, this was an excellent opportunity to use graphic representations of participants' models of I&R and a keyword interest exchange to bring everyone together. In building the models of I&R, we deliberately included a wide range of concepts, knowing that people would agree with some of them and not others. We did this to show the similarities and differences among various points of view, and we wanted to include everyone's ideas as much as possible. The process of building and sharing participants' mental models of I&R is described here, along with examples of the most common models. The interest exchange is described in the section following the examples of the models.

A. MENTAL **MODELLING**

Basic concepts of information and referral

An initial interview questionnaire was developed which included such open-ended questions as :

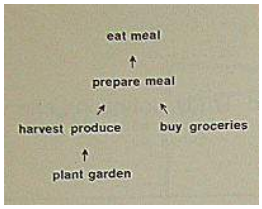
— What are the first few things that come to mind when you think of information and referral ?
— Why do communities and/or individuals need I&R ?
— What information needs do communities have ?
— How do or can I&R services benefit the overall community ?.

These were used to interview about a dozen people who had the variety of points of view about I&R that we expected to be represented at the Fair. The answers were organized into groups of highly similar statements, according to our subjective judgements and understanding of I&R. This task produced a set of concepts about I&R as viewed by the people in our pilot sample. We then developed short labels only a few words long for each of the concepts — always using words which would be understood by the greatest number of participants at the Fair. This set of concepts was used in two ways : (1) as the basis for a list of elements of I&R that were used to construct models of I&R, and (2) as the basis for a list of keyword interest areas.

Developing the models

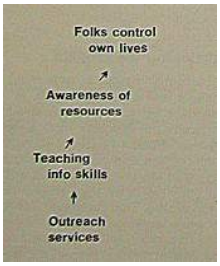
To construct models of I&R from the concepts / elements developed in the first phase of our work, we attempted to organize the elements into a directed graph (or digraph for short) of aspects of information and referral. A digraph consists of elements and arrows among them that represent their relationships to each other. For example, suppose you were working with the following elements : plant garden, harvest produce, buy groceries, prepare meal, eat meal. If you were to use a relationship like « leads to » or « results in, » these

elements could be arranged In a simple digraph like this.



As it turned out, there were actually so many elements of information and referral that creating a complete model of all the relationships among all the elements was too demanding and confusing a task. So, we decided to develop several smaller models, each of which would highlight certain aspects of I&R and the interrelationships among the elements in that more limited context. One model contained elements of existing I&R services, the second some possibilities for expanding I&R services, and the third model sketched out some suggestions for improving the human and social services delivery system.

For example, included in our set of possibilities for expanding I&R were the following elements : (1) outreach — going into the community, rather than waiting for clients (called outreach services), (2) teaching people how to access Information for themselves (called teaching info skills), (3) increased awareness of information resources (called awareness of resources), and (4) helping folks control their own lives (called folks control own lives). After a little experimentation, we found that these four concepts of elements could be organized into a digraph in this way:



The arrows In this partial model of I&R future possibilities can bo road to mean « leads to ». Outreach services load to teaching information skills, which leads to awareness of resources, which in turn leads to folks controlling their own lives. In this way. we organized the thirty-one elements into the three separate models of information and referral. In the process we had to throw out a few elements that we could not fit into the framework, and we also had to clarify, modify, and rename other elements in order to make the picture more clear.

Refining the models

These digraphs represent temporary, subjective estimates of what certain people thought about certain aspects of I&R at a certain time — a snapshot at best. Since we were not in any position to verify the subjective validity of these models, we conducted a test session of the process we would use at the I&R Fair. We took our computer terminal and pilot versions of the final questionnaires to a gathering of local I&R people. We asked them to fill out the questionnaires, and we entered the results into the computer on the spot. During this pilot run, we got important feedback from these people about the questionnaires themselves and about the models built from them. We used the suggestions and criticisms to modify and extend our three master models of I&R.

Writing the models questionnaire

The models questionnaire contained three primary questions corresponding to the three models. Each of these primary questions described one aspect of I&R — existing services, future possibilities, or suggestions for improvements — and then listed a variety of elements / concepts that relate to that area. We asked people to check those concepts that they agreed with or that they thought were important. In this way, each person was asked to indicate which elements in the master models of I&R were included in his or her personal mental model. The models questionnaire also included several other questions of particular interest to some of us on the design team. These questions were not involved in the modeling process.

Facilitating the I & R Idea Fair

The final questionnaires were included in the participants' registration packets at the I&R Idea Fair. We took our computer terminal to the Fair, asked participants to fill out the questionnaires, and entered their responses into the computer during the day. Then we printed out graphic representations (digraphs) of the most frequent points of view and a master list of participants indexed by name as well as by interest areas. Examples of the lists are included (see page 444).

That evening, using an overhead projector, we showed the lour most frequent variations of the three basic models to a group of about seventy-five participants. We talked about the differences in the four digraphs of each model, and people asked questions and made comments. We also showed some of the lists of people in several of the keyword interest areas. The response was quite positive.

After the presentation, we talked to a number of people who were interested in getting their own copies of the digraphs and interests lists. One person wanted a copy of a particular digraph to hang on her wall because she said it really expressed her point of view ! We posted all the digraphs and some of the lists so that participants could look at them at their leisure the nest day. Following the Idea Fair, packets of these materials were sent to all participants who requested them.

It took us about seven hours to do all the work at the Fair, including data entry, editing, file processing, analysis, and printing of the results. We used about $80 of computer time, at Oregon Museum of Science and Industry not-for-profit rates.

B. NETWORKING

Developing the keyword interest areas

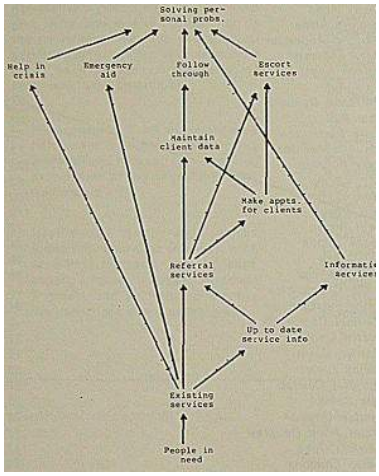
In order to share at a conference, participants have to find others with common interests. We used the list of basic concepts about I&R to help us develop keywords to describe major interest areas. We also took into consideration the subject areas that were being discussed in the various workshops and presentations at the Idea Fair. We combined this information into a final list of interest areas. Some of the I&R concepts were excluded because they were not specific enough or otherwise appropriate for interest areas.

To make it easier for people to participate in the interests exchange, we developed a completely separate questionnaire, which contained a description of the process; blanks for name, agency, address, and telephone number; and the list of keyword interest areas (including an « other » category in case we left something out). Since some of the concepts of I&R included in the models were of moderate political sensitivity among certain groups of people at the Fair, we wanted the responses to the models questions to be anonymous. So we separated the two questionnaires (and even reproduced them on different colors of paper). Some people filled out only one. Altogether,

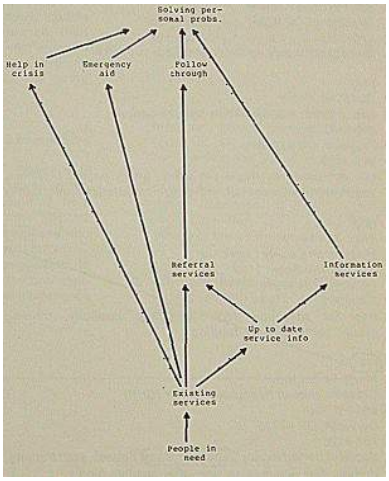
Examples of models :

The following focal points were interrelated by participants In different ways to form several mental models of significant relationships; Examples of these models (in digraph form) are shown below.

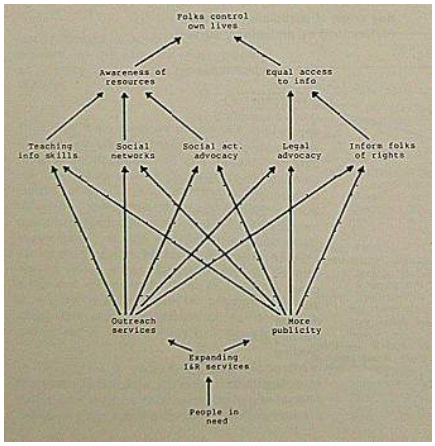
Model 1 :
Important elements of existing I & R services
Digraph of pattern 1, with 14 members (13 %)



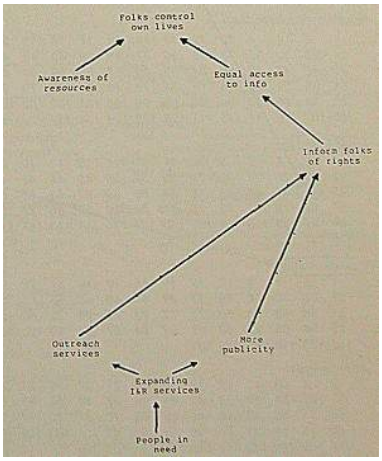
Model 1 :
Important elements of existing I & R services
Digraph of pattern 3, with 5 members (5 %)



Model 2 : Future possibilities for I & R
Digraph of pattern 1, with 24 members (24 %)



Model 2 : Future possibilities for I & R
Digraph of pattern 4, with 4 members (4 %)



Extracts from facilitation documents supplied to participants

Oregon I & R idea fair and workshops, May 17-18, 1977

Participant address and interest directory (registration number order)

(43)
Mary Reynolds
Clackamas County Community Action Agency
825 Portland Avenue
Gladstone, OR 97207
655-8640
Soc act advocacy, crisis counseling, publicity

(44)
Rosalind Weber
Urban League Senior Adult Service Center
3904 NE Union
Portland, OR 97212
288-8338
soc act advocacy, legal advocacy, green pages, burn out, publicity networks, staff, training, computerized info banks

(45)
Alice Stuckey
Multnomah County Legal Aid
310S W 4th, Room 1100
Portland, OR 97214
224-4086
Soc *act advocacy, legal advocacy, publicity, training groups confidentiality, funding*

(46)
Maria ne Baldwin
Corvallis Human Resources Center (DHR)
850 SW 35th
Corvallis, OR 97330
757-4226
Social action advocacy.legal advocacy *tielines, staff training, groups, data dec making, computerized info banks*

Participants grouped by interest areas (referencing participants by number)

Socia *ac* *adv* */*
1 2 *4* 8 *10* 72 13 74 75 17 78 79 20
24 28 *30* 32 *33* 35 36 37 38 39 40 43 44
45 *46* *47* *48* *50* *54* 55 56 57 58 59 62 63
64 *65* 66 *67* *68* *79* 77 72 73 74 76 79 80
83 84 85 *94* 95 98 99 10 70 70 70 704
705 10 77 *11* 77 72 72 72 72 (3

legal advocacy
1 2 5 *7* *8* 70 77 73 74 75 77 79 27
22 23 *26* *27* *30* 34 35 37 39 40 47 42 *44*
45 *48* *49* 55 58 59 60 62 63 65 66
67 68 *70* *71* *73* 75 78 79 80 85 88 90
94 95 99 *10* *10* 70 70 11 11 11 119
125 12 73

(confidentiality)
1 5 7 *8* 72 *13* *14* 77 *18* 79 27 22 26
27 28 32 *34* 35 *37* *39* 42 *45* 48 53 55 56
57 58 59 *63* 66 *71* *72* 73 75 76 79 80 81
83 84 85 *86* 89 97 93 94 97 98 99 70 702
103 10 77 *12* 72 13

green pages
2 3 8 *10* 72 77 78 20 21 22 25 27 28
29 *31* *34* 38 39 *40* *41* 44 47 48 52 53 54
55 56 *60* 63 65 66 *67* 68 70 77 72 77 79
84 85 90 97 *34* 96 97 98 99 70 70 70 706
107 70 11 <7 *11* 72 73 73 73 73

Participant name / registration number (alphabetic order)

Name	*Number*
Pat Abeita	65
Laurel Airrington	126
Becky Alien	*40*
Virginia Alzner	*10*
Marjorie Anderson	*97*
Mary Anderson	*115*
Aurora Angel	*12*
Julia Apt	*15*
Marianne Baldwin	*46*
Lola Ball	*92*
Dana Barricklow	38
Alicia Benavidez	*13*
Gary Pullman	*130*
Ann Bishop	*68*
Frances Bodle	*102*
Lola Boyett	*113*
Beth *Brown*	*27*
Jesse Bunch	*24*
Pat Casey	*99*
Alta Chalfant	*95*
Judie Chamberlen	*28*
Catherine Charron	*84*
Michael Chocholak	*2*
Evelyn Chose	*21*
Marilyn Clark	*19*
Nancy Clow	*88*
Marjorie Cowles	*127*
Ella Curran	*93*
Debbie Dawson	*78*
Sister Anne Deuprey	*17*
Patricia Duke	*117*
David Emmons	*89*
Margaret Esler	*85*
Verna Forbes	*112*
Jan Fortier	*26*
Anita Foster	*14*

Key areas of participant interest (determined by preliminary survey)

Soc act *advocacy*
burn out
(confidentiality)
crisis counseling
networks
staff training
data dec making
computerized info banks
data collection
work w / pub libraries
handicapped
mental models
legal advocacy
publicity
green pages
alc /drug probs
tielines
training groups
funding
resource file & library
sr. ci. legislation
special ed
produce referral

133 people filled out the interest questionnaire, and 104 people answered the models questions.
Example pages of the master list of participants, the keyword index, and the alphabetical index are included here. (see page 444).

Going further

The methods described here are simple and fairly inexpensive. Depending on the conference, meeting, gathering, or whatever, some variations or extensions might be more appropriate. Here are some additional possibilities.

1. Have people fill out questionnaires beforehand so that the final models and interests lists can be distributed to everyone at the beginning at the conference.

2. Have people specify additional information about their interests, such as willing to teach, want to learn, expert, amateur, willing to moderate a group, and so forth, to improve the usefulness of the exchange.

3. Have the computer create special packets for participants containing lists of people interested in the same areas that they are.

4. Combine both questionnaires so that the model data will not be anonymous. Then people can also find out who thinks about or views a topic in the same way they do.

5. Use pre-conference responses in a presentation of interests and models at the start of the conference. Then use the participants' reactions and comments to update or improve the models and interests lists during the conference session.

6. Use electronic group dialogue hard ware to :
a. build the models interactively with conference participants to improve their accuracy and to help people identify with the models (models mean the most to those who participate in their construction);
b. respond to the questionnaires in a group at the start of the conference, providing virtually instantaneous feedback of the results.

7. Develop a third questionnaire that contains a list of all participants. Have people check all people they know. Use the results to :
a. show existing networks of people
b. show how interest and point of view information can be used to extend existing networks;
c. give each participant a list of all people known by the people they know but not known by them (potential new friends and acquaintances), showing what those people are interested in;
d, collect data later in the conference about who now knows whom to show how the network of people is growing.

8. Use the computer to format and print an « instant conference directory » of all participants, indexed by interests and points of view. Have it ready to give to people as the conference closes. Or, if pre-registration information is available, have the directory ready at the beginning of the conference.

9. After the conference continue the facilitation with a participatory newsletter.

(Continued from page 435).

Computer conferencing and productivity in Science

by Linton Freeman

Social networks scholars are, at this moment, in the process of developing an identity as a single research community *

Thus, the main purpose of this project is to maximize the productivity of individual participants and to encourage the development of a cumulative collective effort, in addition, the facilitation of regular information exchange can be expected to yield a noticeable improvement in the coordination and cumulation of the efforts of the community as a whole. Conflicts can be aired and independent ideas related in a setting that encourages collective effort and the development of agreements about proper ways to proceed.

If the project is successful, therefore, it seems reasonable to expect that a major new organized intellectual force will emerge in social science. •

REFERENCES

* *The International Network for Social Network Analysis (with its secretariat in Toronto) has only recently been formed.*

Anonymous
1976 The Network Alternative : an Exploratory Encounter between Practitioners, Social Scientists and Specialists, Montreal : Concordia University. 18-20 November 1976 (this journal. October 1977)

Barnes, J.A.
1972 Social Networks, Boston : Addison-Wesley Module, 26. 1-29, Hilts, Starr Roxanne and Murray Turoff.
n.d. Effective Communications Structures

for Technology Assessment, Newark : New Jersey Institute of Technology, mimeo.

Johansen, Robert, Jacques Vallée, Kathleen Spangler and R. Carry Shirts
1977 The Camelia Report : A Study of Technical Alternatives and Social Choices in Teleconferencing, Menlo Part, California ; Institute for the Future. Report R-37.

Kuhn, Thomas S.
1970 The Structure of Scientific Revolutions, Chicago ; University of Chicago Press, second edition.

Mitchell, J.C.
1969 Social Networks in Urban Situations. Manchester : University Press.

Mullins, Nicholas C.

1973 Theories and Theory Groups in Contemporary American Sociology, New York : Harper and Row.

Turoff, Murray
1977 An One-line Intellectual Community or « MEMEX » Revisited, Newark : New Jersey Institute of Technology, mimeo.

International computer conferencing by NGOs and IGOs

A surprising number of experiments in the use of computer conferencing have already been made by international organizations. Some of those of which we have been informed are mentioned below:

International Society for Technology Assessment : This organization used the CONFER computer conferencing facilities during the course of its second international congress in Ann Arbor (Michigan, USA) to facilitate interaction between participants physically present at the meeting site. (A full report is given on pages *414-417* of this issue),

— United Nations Educational, Scientific and Cultural Organization : The 19th General Conference of Unesco was held in Nairobi in October-November 1976 over a period of five weeks. A satellite link to the Unesco Secretariat in Parts permitted officials, delegates, translators, journalists and others to interact with those physically present in Nairobi (A full report is given on pages *423-424* of this issue). It is expected that further experiments of this kind will be undertaken using the Franco-German Symphonie satellite (which apparently cannot be exploited commercially because of the terms of the contract under which it was launched in the United States).

— Hotline International : This is a program initiated by Glen Leet as President of the Community Development Foundation (New York), Its purpose is to broaden the impact of intergovernmental conferences by permitting more people to play a role in the decision-making process and to heighten understanding of what occurs at such international conferences. The system was first demonstrated in April 1974 during the meeting of the Governing Council using a portable computer terminal linked via telephone line to a computer in the United States into which many North American based groups were also linked. A similar approach was used during the course of the UN World Population Conference in August 1974 and again in Nairobi in April 1975 at another meeting of the Governing Council. In June 1975 at the UN Conference on Women the system was expanded to link groups in 10 US cities as well as in Vancouver and Mexico City. During a 17-day period over 100 North American NGOs were linked to discuss items on the conference agenda. The Hotline system was also used during the UN Habitat Conference in Vancouver in 1976.

— European Management Forum : This Geneva-based NGO used the PLANET system (currently marketed by INFOMEDIA Corporation in California) to interact with economists in New York and California in order to obtain expert opinions on technology transfer to developing countries.

— International Union of Geological Sciences : The IUGS Committee on Storage, Automatic Processing and Retrieval of Geological Data was used from August to December 1975 by participants in 9 countries in order to plan two major face-to-face meetings in December at which time the PLANET system (cited in the previous example) continued to be used by participants to maintain contact with their respective national institutes. Main uses of the system then and thereafter were to coordinate organization of meetings and workshops, define and resolve certain technical problems connected with the data to be exchanged at the workshops, arrange further travel between collaborating institutes, and extend the discussion of important documents which could not be adequately explored during the time-limits of a face-to-face meeting,

— International Telegraph and Telephone Consultative Committee : In anticipation of full use of computer conferencing, the Chairman of one CCITT working group arranged for a simulation of the work of the committee on the FORUM system of the Institute of the Future (based in California). A debate between national delegations with position papers was conducted on integrated digital networks. There are probably a number of other cases of the use of computers to assist interaction between participants at international meetings or as a substitute for meeting. (There are many examples of the exchange of scientific data between national institutes under the auspices of some international body. This is particularly necessary in the case of meteorological data, seismic data, astronomical phenomena, and other international scientific programs.) Such systems are also used by some multinational corporations to facilitate the action of task forces.
Aside from actual use of such techniques, there have been a number of conferences of international bodies concerning the future use of such techniques :

— Organization for Economic Cooperation and Development : In 1975 in Paris a conference on computer telecommunication policy was held.

— International Council on Computer Communication : This body holds a periodic conference every two years (1972, 1974 and 1976); many technical papers on computer conferencing are presented.

— North Atlantic Treaty Organization : NATO is holding a telecommunications symposium in September 1977 (Some of the points to be discussed are noted on pages 123-456 of this issue).

— Society for General Systems Research : In February 1977 in Denver during its annual meeting, a workshop was held on « on-line intellectual communities ».
Other international bodies are currently planning to use such techniques. For example the International Political Science Association has a Research Committee on Peace and Conflict. Under the direction of the Chairman, J David Singer, computer conferencing has been « used on a trial basis within the University of Michigan community, and also in connection with peace researchers at the Universities of Pittsburgh and Rochester, with excellent results to date. It looks now as if we can not only extend the network of peace researchers and others through out North America within a few months, but also as if we can tie into a Western European network within a year or so. As to Eastern Europe, some informal discussions are already under way, and the problems do not seem insurmountable. For South America, Africa and Asia, however, the logistic and financial problems will be more serious. But our hope is to eventually establish a world-wide net that would dramatically enhance not only communications in general, but the kind of rapid and open exchange that could lead to major increase in scientific research on the problems of war, peace, and social conflict », (extract from a letter of July 1977).

Computer conferencing : costs and sources

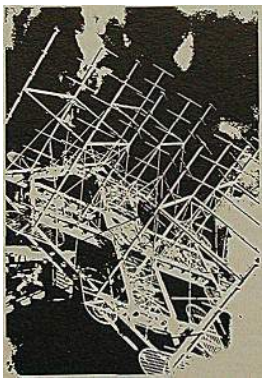
The costs of computer conferencing are decreasing rapidly with the spread in the number of institutions equipped with suitable terminais (usually hired or purchased for other purposes) and with the increase in the number of commercial services offered via data networks. The following information is therefore offered only as a guide, based on experience in different settings in the USA.

It is important to note that in a specific case costs can often be absorbed into other budgets, for example when a number of research institutions already linked by data networks agree to the use of equipment and computer time at cost or at a subsidized rate. It is important to note that it is not necessary to consider the cost of purchasing or renting the central computer which maintains the links between the networks of terminals, since this can be done via a large computer common in many institutions or available to them on a service bureau basis. The main cost elements are the following :

1. Terminal equipment: It is possible to rent or lease terminals from manufacturers and from data networks (whether commercial or governmental). It is expected that by 1980 terminals will become an overhead item (like a typewriter, telephone, or desk calculator) at most research institutions.
   Purchase :
   1977 — $ 1500-4000
   (maintenance $ 450 per year)
   1980 — $ 300-600
   Rental :
   1977 —$ 75-150 per month
   (installation charge $ 100)
   The costs vary with the type and quality of equipment (ability to reproduce diagrams, provide paper copy, etc).

2. Communication with a data network contact point (a « network port ») : Commercial and other data networks significantly reduce the cost of data transfer between distant points (e.g. across a continent). However those outside a metropolitan area have to link into such networks at the closest point. This can usually be done via a single telephone line. The cost of using the telephone for this purpose is therefore dependent upon the telephone rate charge for the distance involved. This may be either the price of a local call, an inter-city call, or an international call (if there is no network port in that country). The length and cost of the call depend on the amount of time the terminal is in use.

3. Use of data network : If a data network is required to link participants at distant locations, the costs are:
   1977 — $ 3.50 - 12.00 per hour
   (depending on the network used)
   Network rates are expected to decrease slowly with the development of more efficient technology for message or packet processing.



4. Computer utilisation : This is charged on the basis of the number of « resource units » used in a given session (i.e. what the computer actually does rather than time spent waiting for the participant to finish something to be processed).
   1977 — $ 0.12 per resource unit or approximately
   — $ 4.00 per hour (of effective use)
   It is expected that these costs will decrease by more than 50 % by 1980 with the introduction of mini- and micro-processors. It has been suggested that a total of $ 20 per participant is a generous estimate for a typical conference.

5. Use of computer data storage : A conference is a file which resides on a mass storage device. Charges are made on the basis of the number of characters stored.
   1977 — $ 0.45 per month (for 1000 characters)
   This cost may be significantly reduced if the data is stored in « blocks ».

6. Use of computer conferencing software : A charge may be made to the organizer for the use of the program which supports the conference interaction.
   1977 — $ 5.00 per hour (in the case of the PLANET system).

7. Administrative overheads : Commercial networks also include flat rate handling charges and special software packages :
   1977 — S 25.00 per month per participant (in the case of the PLANET system).

Total cost summary :

A recent overall estimate by the Computerized Conferencing and Communication Center of the New Jersey Institute of Technology suggests that operating a multi-conference computer system on a nation-wide data network costs :
S 8.00 per hour per person for a system with 300 participants
S 5.00 per hour per person for a system with 1000 participants
This is cheaper than the hourly cost of long distance telephoning (in the USA) and cheaper than the cost of maintaining communication through the mail between 20 people. And there is no comparison with the travel costs of bringing such people together at one place and accommodating them for a face-to-face meeting, even when the costs of their absence from their own organizations are excluded. Even in a large building complex, 10 people whose time was worth more than $ 10.00 per hour (per person) would save money by using a computerized conferencing system rather than calling a committee meeting.

Note : If a (multi-) conference was supported or subsidized by a network of academic or government institutions, it is highly probable that costs : 4, 5. 6, and 7 would be absent or subsidized. If the (multi-) conference was held at one particular location to facilitate interaction between participants in a conventional conference environment, it is probable that :
costs : 2 and 3 would be absent
cost : 1 would be absent if many terminals were already available, as is the case on many US university campuses.

For further details see : Murray Turoff. The costs and revenues of computerized conferencing. In : Proceedings of the 1976 1CCC, Washington, International Council on Computer Communication, 1976.

SELECT BIBLIOGRAPHY

Center for Research on Learning and Teaching, University of Michigan. Ann Arbor, Michigan.
— Group Viewing of interactive Computer Output : a description of techniques and devices. 1973.
— User's Guide for CONFER II: an introduction to computer-based conferencing, by Robert Parnes, H C Honch and K L Zinn. Nov. 1976, 25 p.
— Organizer's Guide to CONFER II : organizing a computer-based conference, by H C Hench. K L Zinn and R. Parnes. Jan 1977. 22 p.
— Computer facilitation Of communication within professional communities by Karl L. Zinn. in : Behavioral Research Methods and Instrumentation, April 1977.

Computerized Conferencing and Communications Center. Computerized Conferencing Research Summary (A collection of papers by members of the Center). Newark, New Jersey Institute of Technology, 1977 (Research Report No. 31) .

Carlisle, James H. Behavioral problems in computer-based conferencing. Marine Del Rey, California, USC/Information Sciences institute, 1975.

Chapanis, Alphonse, Interactive human communication, Scientific American, 23, 2. 3, March 1975. pp 36-42.

Conrath, David W and James H Blair. The computer as an interpersonal communication device; a study of augmentation technology and its apparent impact on organizational communication. In : Proceedings of the 2nd International Conference on Computer Communications (Stockholm, August 1974).

Day, Larry. Computer conferencing : an overview. In : N Macon (Ed). Computer Communication: views from ICCC 1974. Washington , International Council for Computer Communication, 1974.

de Sola Pool. Ithiel. The international aspects of computer teleconferencing (paper for Conference on Computer Telecommunications Policy, Paris, OECD. 1975).

Englebart, D C. Augmenting Human Intellect; a conceptual framework. Menlo Park. Stanford Research Institute, Center for Augmenting Human Intellect. 1962.

Englebart. D C. Intellectual implications of multi-access computer networks (Paper for the Proceedings of the Interdisciplinary Conference on Multi-access Computer Networks, Austin. 1970).

Englebert. D C. Richard W Watson and J C Norton. The augmented knowledge workshop. In : AFIPS Conference Proceedings. NCC. AFIPS Press. Montvale. NJ. 1973.

Englebart, D C et al. The augmented knowledge workshop. In ; Computer Networking, edited by Blanc and Cotton. IEEE Press. 1976.

Hiltz. Starr Roxane. Computer conferencing; assessing the social impact of a new communications medium. Technological Forecasting and Social Change, 10, 1977. pp 225-238.

Hiltz. Starr Roxane. The impact of a computerized conferencing system upon scientific research specialities. [Unpublished paper available from Computerized Conferencing and Communications Center. New Jersey Institute of Technology, 1976).

Hiltz, Starr Roxane. Communications and group decision-making; experimental evidence on the impact of computer conferencing. Newark, Computerized Conferencing and Communications Center, New Jersey Institute of Technology, 1975 (Research report).

Hiltz. Starr Roxane and Murray Turoff. Computer mediated communications and the disadvantaged. (Unpublished research paper available from the Computerized Conferencing and Communications Center. New Jersey Institute of Technology, 1976).

Hiltz. Starr Roxanne and Murray Turoff, Potential impacts of computer conferencing upon managerial and organizational styles. Interlaces, (a 1977 issue).

Hiltz. Starr Roxanne and Murray Turoff. The Network Nation; applications and impacts of human communications via computers. Reading, Mass, Addison Wesley. Advanced Book Program, 1978.

International Council for Computer Communications. Proceedings of the International Conference on Computers and Communications (1972 1974 and 1976).

Johansen. Robert. Pitfalls in the social evaluation of teleconferencing media. In : Lorna A Parker and Betsey Riccomini (Eds). The Status of the Telephone in Education, Madison. University of Wisconsin Extension Press. 1976.

Johansen. Robert, et ai. The Camélia Report; a study of technical alternatives and social choice in teleconferencing. Menlo Park. Institute for the Future, 1977.

Judge, A J N Communication and international organizations, International Associations, 22, February 1970. pp 57-79 (A forecast of the impact of computers and communication devices on local, national and International associations).

Kochen, Manfred (Ed), Information for Action. New York, Academic Press 1375.

Kupperman, R H and S C Goldman. Toward a viable international system; crisis management and computer conferencing. In : N Macon (Ed). Com - puter Communication: views from ICCC 1974. Washington , International Council for Computer Communication 1974.

Macon, N (Ed). Computer Communication; views from ICCC 1974, Washington International Council for Computer Communication, 1974.

Morris, S and G Morgan. Human responses to sulphur pollutants; proceedings of a computer-based conference. Brookhaven National Laboratory, 1974.

Overhage. C J and J R Harman. Intrex. Cambridge. Mass. MIT Press 1965

Overhage, G J and J R Harman. The on-line intellectual Community and the information transfer systems at MIT in 1975. In ; M. Kochen (Ed) The Growth of Scientific Knowledge. New York. Wiley. 1957.

Panko. R H. The Outlook lor Computer Message Services; a preliminary assessment. Menlo Park. Stanford Research Institute. 1976.

Price, Charleton. Conferencing via computer. In : Harold Linstone and Murray Turoff (Eds). The Delphi Method; techniques and applications. Reading. Mass. Addison Wesley. 1975 (with technical bibliography).

Turoff , Murray. The state of the art; computerized conferencing. In : N Macon (Ed). Computer Communication ; views from ICC 1974. Washington , International Council for Computer Communication, pp 81-87.

Turoff, Murray. Potential applications of computerized conferencing in developing countries. Ekistics, 38. 225, August 1974. pp 131-132.

Turoff. Murray. The future of computer conferencing. The Futurist, IX, 4, August 1975. pp 182-195.

Turoff, Murray. Human communications via data networks. In : Computer Networking edited by Blanc and Cotton. IEEE Press, 1976.

Turoff, Murray. The cost and revenues of computerized conferencing. In: Proceedings of the International Conference on Computers and Communications, Toronto , 1976. Washington, International Council for Computer Communication, 1976.

Turoff. Murray. User Information Brochure for EIES (Electronic Information Exchange System). Newark. Computerized Conferencing Communication Center, New Jersey Institute of Technology, 1977 (research report no. 7).

Turoff, Murray, An on-line intellectual community or MEMEX revisted. Technological Forecasting and Social Change. 10. 4. 1977.

Turoff, Murray and H Gage, Computerized conferencing and the homebound handicapped. Newark, Computerized Conferencing and Communications Center, New Jersey Institute of Technology, 1976 (Research report no. 6).

Turoff. Murray and Starr Roxanne Hiltz. Computerized conferencing; the new communications revolution ? Spectrum, May 1977.

Turoff, Murray and Starr Roxanne Hiltz. Computerized conferencing; a review and statement of issues (Paper presented at the NATO Telecommunications Symposium, Bergamo. Italy. September 1977).

Vallée, Jacques. Network conferencing. Datamation, May 1974.

Vallée, Jacques et al. The computer conference; an altered state of communication ? The Futurist. IX, 3, June 1975. pp 116-121.

Vallée, Jacques, R Johansen, R Randolph and A Hastings, Group Communication through Computers. Menlo Park. Institute for the Future
Vol. 1 : Report R-32, 1974
Vol. 2 : A Study of Social Effects. Report R-33. 1974
Vol. 3 : Pragmatics and Dynamics. Report R-35. 1975.

Vallée, Jacques and B Gibbs. Distributed management of scientific projects; an analysis of two computer-conferencing experiments at NASA. Telecommunications Policy, December 1976. pp 75-85.

Vallée, Jacques and T Wilson. Computer-based Communication in Support of Scientific and Technical Work (Final report to NASA on network experiments with the PLANET system). Menlo Park. Institute for the Future (Working paper WP-24) 1976.

Vallée, Jacques and Gerald Askevold. Geologic applications of network conferencing; current experiments with the FORUM system. In: Peter Lykos (Ed). Computer Networking and Chemistry, Washington. American Chemical Society. 1975.

Zinn, Karl L et al. (Eds) Computers in the Instructional Process; report on an international school. Ann Arbor. EXTEND Publications, 1974.

Vallee, Jacques. The FORUM project; network conferencing and its future applications. Computer Networks, 1, 1976. pp 39-52.

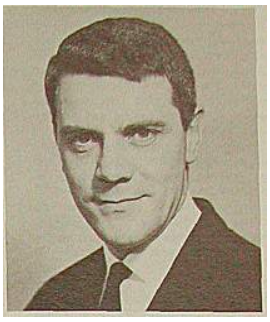
Videotapes

Center for Research on Learning and Teaching, University of Michigan, Ann Arbor, Michigan,
_ Introduction to CONFER by H, Chris Hench. Oct 1976. 18 minutes, 1 / 2 in. real or 3/4 In. cassette,
_ Sample use of CONFER at the ISTA Congress by Karl L, Zinn . Oct 1976. 30 minutes.

Center for Augmenting Human Intellect, Stanford Research Institute, Menlo Park , California, Video presentations of the augmented knowledge workshop.

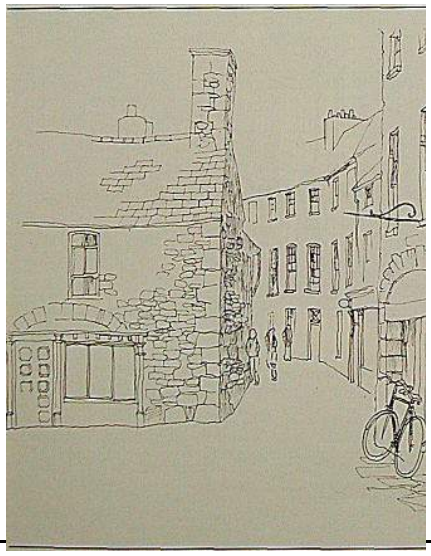
CONGRES DOCUMENTATION

By Robert P. Manson*



The production of congress documentation becomes more expensive with each passing year. The increasing cost of paper combined with escalating printing charges means that the cost of congress documentation is taking a larger and larger share of the congress budget. These factors have led many professional congress organisers to re-examine ways of stabilizing this cost element.

The first piece of literature to be received by most congress participants will be the « preliminary announcement brochure » or, if it is a scientific meeting, the « call for papers ». In a majority of cases, these are combined in a single brochure which, because of its early publication date, simply outlines the area to be covered by the congress programme in a thematic statement, This brochure also indicates the venue, date of the congress and languages to be used. Frequently this piece is overprinted on a tourist brochure of the - shell » type which is usually available free of charge from national tourism agencies. If this is to be a multilanguage brochure, space considerations may require it to be designed specifically for this purpose. It is usual to attach a preliminary, non-binding, booking form which has the objective of monitoring initial interest, testing the channels of distribution and extending the mailing list.



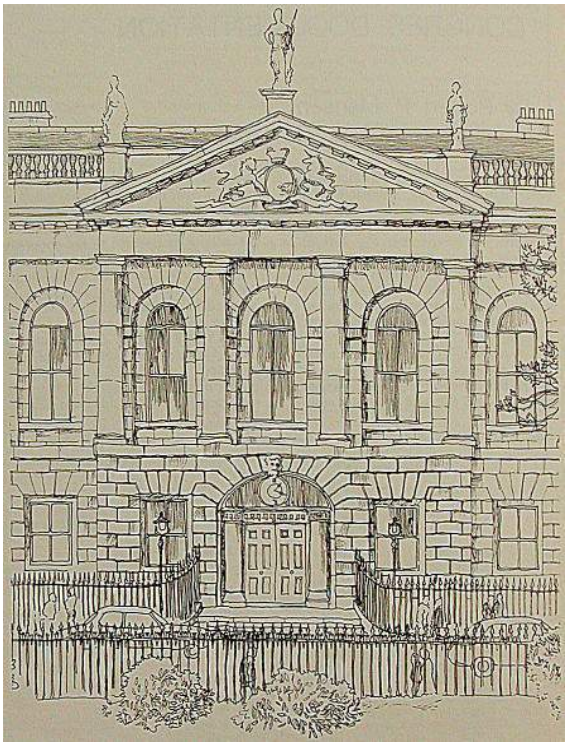
Approximately eight months before the congress is due to take place, the substantive congress brochure, sometimes referred to as the « second announcement brochure », is distributed. Because this is the major element in the marketing of the congress, it must contain all information required to enable the prospective participant to decide to attend. This will include, in considerable detail, information on the meeting programme, a schedule of social events, programme for accompanying persons and general information on the venue, registration arrangements, etc. Registration forms to enable participants to register in advance and make accommodation reservations are included with this brochure. To encourage early registration, it is normal practice to offer a two-tier registration fee which penalises those whose forms are not received before the recommended date. If an abstract or summary is to be submitted, then it is usual to include an abstract form and instructions on how papers should be presented.

When the registration form has been received in the offices of the congress secretariat, it is acknowledged and a receipt issued to the participant. This acknowledgement / receipt document is generally referred to as the « congress card ». It is this piece of paper which the congress participant will present at the registration desk in the congress centre, in exchange for the meeting satchel and its contents, which may

* *Director. Congresses and Expositions Ltd., Dublin, Ireland and Board Member International Association of Professional Congress Organisers.*

include tickets and invitations to social events, lapel (identification) badge, final version of congress programme, list of participants, together with maps and other tourist literature. For aesthetic reasons and to produce maximum impact, it is desirable that all congress documentation should have a homogeneity of graphic design and presentation. Good design is not synonymous with expensive presentation. In a tight budget situation, good presentation can be achieved, without recourse to expensive typesetting techniques and remarkably effective results can be achieved by the professional graphic designer using setting prepared on the ordinary office typewriter.
In certain scientific and technical meetings, there may be a demand for the publication and distribution to participants after the congress of a bound volume of the proceedings. If the subject merits it, a commercial publisher may be persuaded to take over the publication of this book. It is critically important that the publishing house so involved should be brought into the discussions about the nature and scope of the proceedings at the very earliest opportunity and before irreversible decisions have been taken. Clearly, if a publisher can be interested in such a project, it relieves the organising committee of much work of a highly specialized nature.

The time taken to publish a proceedings volume can be quite considerable given the editing and revision work which sometimes has to be carried out. The final version of the text needs to be checked and approved by the authors after which the copy has to be typeset, printed and bound.
The development of the small-offset printing press and its general availability, together with simple-to-operate print finishing systems, have made the complete in-house production of good quality print from camera-ready copy possible. The great advantage of this technique is speed. If required, bound conference volumes, based on the authors' original typescript, containing line diagrams and half tone illustrations can be produced in quantity and to an acceptable print standard overnight. This technique is being used more and more in the production of preprints and abstracts. These are normally issued prior to the meeting. Ideally participants should receive the preprints or abstracts some weeks ahead of the meeting so as to have adequate time to study them. Because authors are not always very prompt in submitting their scripts, these sometimes have to be distributed at registration, preprints contain the full text of papers to be presented at the congress. Speakers are then allowed from ten to twenty minutes to present a summary of the.



full paper. Used in this way, preprints can contribute significantly to the success of a congress by allowing more time for discussion.
If there are many papers to be presented at a congress instead of producing the full text of each paper the congress organiser may opt to print an abstract of the congress paper. In preparing their abstracts authors are usually required to present their material on a pre-printed form which is designed for offset reproduction. Rigid conditions relating to layout of text, and clarity of both typescript and illustrations have to be compiled with. Abstracts are normally limited to a few hundred words and are printed on one shoot of paper alter which they are bound into a volume ready for distribution. One advantage relating to the publication of a book of abstracts is that it helps congress participants to decide which sessions to attend. However, it does have the disadvantage that authors need to present their papers in full to the meeting. If publication of the full text of the paper after the congress is not envisaged, it puts the additional burden on the author of seeking publication elsewhere.
Electronic media are meeting a wider acceptance as a method of storing and retrieving congress data. Microform techniques, particularly microfiches and audio cassettes have the advantage of being quick to produce, easy to

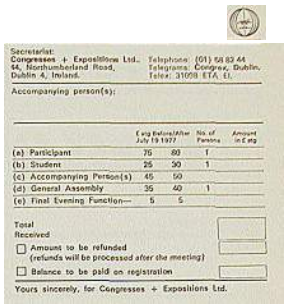
store and are less of a commercial risk, than say, the publication of a volume of proceedings. However, they are less portable than the printed word and are meeting with some consumer resistance particularly from the scientific community. With the accelerating rate of technological innovation in the electronics industry and the consequential reduction in the cost of video cassette recording, the growth of V.T.R. in congress communication is likely to increase. In the brave new electronic world of the 80's participants will be able to take with them from their congress a cassette containing a complete record of their meeting which can be played back on their home TV set. •

CONGRESS CARD

date

Dear Sir / Madam
We thank you for your registration and have pleasure in enclosing your congress card. On presentation of this card, you will receive the congress documentation at the registration desk in the Royal College of Surgeons, Dublin.

The desk will be open on Sunday, September 18th from 10.00 to 17.00 and on Monday, September 19th from 08.30 to 18.00 to process registrations.



Secretariat:
Congresses + Expositions Ltd.,
44, Northumberland Road,
Dublin 4, Ireland.

Telephone: (01) 68 83 44
Telegrams: Congrex, Dublin.
Telex: 31059 ETA EI.

Accompanying person(s):

	£ sig before/after July 19 1977		No. of Persons	Amount in £ stg
(a) Participant	75	80	1	
(b) Student	25	50	1	
(c) Accompanying Person(s)	45	50		
(d) General Assembly	35	40	1	
(e) Final Evening Function—	5	5		

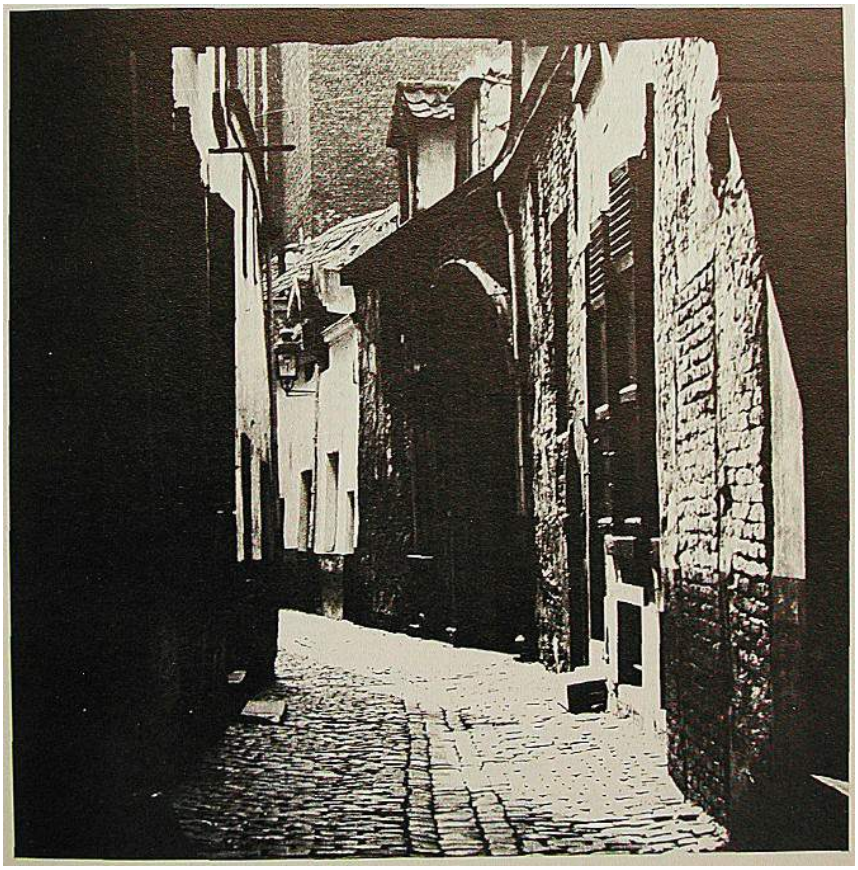
Total
Received

☐ Amount to be refunded
(refunds will be processed after the meeting)

☐ Balance to be paid on registration

Yours sincerely, for Congresses + Expositions Ltd.

INBEL



INTERNATIONAL CONGRESS CALENDAR 1977

17th EDITION

8ème SUPPLEMENT

Le signe • indique un changement ou complément aux informations publiées précédemment.

8th SUPPLEMENT

The sign • indicates supplementary information of modification to previous announcements.

1977 Nov 21-20 Kuala Lumpur (Malaysia)
Asian Pacific Dental Students Association. 7th Annual congress. P : 220. c : 9 (YB n° 3778)
The Dental Society, c/o University Malaya, Jalan Pantai Baru, Kuala Lumpur.

1977 NOV 23-25 Strasbourg (France)
Council of Europe. Colloque sur l'énergie et l'environnement. (YB n° 435)
MM Hartland et Christensen, Greffe, Conseil de l'Europe, avenue de l'Europe, F-67008 Strasbourg cedex.

1977 Nov 25-26 Versailles (France)
Int Association of Environmental Coordinators. Symposium : Risk assessment and risk acceptance. (YB n° 2420)
IAEC, avenue Fr Roosevelt 112, Bte 8, B-1050 Brussels, Belgium.

1977 Nov 23-30 London (UK)
European Society for Artificial Organs. Meeting. P : 200.
Conference Services Limited, The Conference Centre, 43 Charles Street, Mayfair, London W1X 7PB, UK.

1977 Nov 28-30 Singapore (Singapore)
SIA World marketing conference. P: 120.
SIA, Airlines House, Paya Lebar Road, Singapore 19.

1977 Nov 28-Dec 1 London (UK)
The 2nd European-American advertising age conference. P : 300.
Mr D E Raymond , Crain Educational Division , Crain Communications Inc.,
740 Rush Street. Chicago, IL 60611, USA.

1977 Nov 28-Dec 2 Novosibirsk (USSR)
Int Institute for Applied Systems Analysis. 3rd Conference on energy resources.
Prof Michel Grenon, Scientific Secretary, IIASA, Schloss Laxenburg, Austria.

1977 Nov 28-Dec 3 Warsaw (Poland)
UNIDO . Promotional meeting on int co-operating for establishing and promoling industrial co-operatives in developing countries. P : 30. (YB n° 3386)
Unido, POB 707, A-1011 Vienna.

1977 Nov 29-30 Wurtzburg (Germany, Fed Rep)
Int Council for Building Research Studies and Documentation. Working Commission W62 - Water Supply and Drainage for Buildings. Meeting. (YB n° 1723)
CIB. POB 20704, NL-3001 JA, Rotterdam, Netherlands.

1977 Nov 29-Dec 7 Kathmandu (Nepal)
Colombo Plan Consultative Committee . Conference : Review the socio-economic progress of the region and thrash out the major tasks ahead. P: 250. C: 27. (YB n° 281)
The Secretary-General, 26th Colombo Plan Meeting Secretariat, Royal Nepal Academy Building, Kamaldi, Kathmandu, Nepal.

1977 Nov 30-Dec 2 Davos (Switzerland)
Organisation Gestosis. 9th Meeting. (YB n°4165)
Secretary 9th Meeting OG, Mr Carlo Grassi, c/o Medichemie, Postfach, CH-4002 Basel, Switzerland,

1977 Nov 30-Dec 2 Los Angeles (Cal, USA)
Center for Management Education, Graduate School of Business Administration, ' University of Southern California. Workshop : Futures research technique for corporate planners.
Reservation Manager, University Hilton Hotel, 3540 South Figueroa Street, Los Angeles, Cal 90007.

• 1977 Nov 30-Dec 2 London (UK)
Cargo Systems/Int Cargo Handling Co-ordination Association. 2nd Conferemce for the container industry.
Cargo Systems Int. 201-205 High Street. New Maiden, Surrey K13 4BH, UK.

1977 Nov 30-Dec 2 Lyon (France)
Int Agency *to, R*esearch on Cancer/Institut National de la Santé et de la Recherche Médicale. Symposium : Carcinogenic risks-strategies for intervention. (YB n° 3549)
Or W/ Davis, Secrétaire organisateur. Centre Int de Recherche sur le cancer 150 cours Albert-Thomas, F-69372 Lyon cedex 2.

1977 Nov Chang Mal (Thailand)
Asian seminar on research and epidemology on drug dependance.
Prof Prasop Ratanakorn, Director, Drug Dependence Research and Prevention Centre, 268 Rama 6. Phyathai, Bangkok 4, Thailand,

1977 Nov Rio de Janeiro (Brazil)
Société médicale du Brésil/Collège Brésilien des chirurgiens. 60 Symposium int des soins d'urgence.
Pr Brenildo Tavares, CP 14 700 Ipanema, Rio de Janeiro.

1977 Nov Mexico (Mexico)
Association Dentaire Mexicaine. 15e Congrès national et 7e Congrès Int.
Asociacion Mexicana. a.c. Ezequiel Montes n°92, Mexico 4.

1977 Nov-Dec New Delhi and Madras (India)
FAO. Seminar on farm grain storage. (YB n° 971)
Chief, Conference Programming Section, FAO, Via délie Terme di Caracalla I-00100 Rome.

• 1977 Dec 3 Rome (Italy)
FAO. Council. 73rd session. (YB n° 971)
Viale delle Terme di Caracalla, I-00100 Rome.

1977 Dec 3-6 Kuweit (Kuweit)
Pan Arab Dental Federation . 10th Congress.
Dr A M, Secretary, Kuweit Dental Association, POB 11065, Sulaibikhat, Koweit.

1977 Dec 5-9 New Delhi (India)
Int Union of Theoretical and Applied Mechanics /Int Union of Geodesy and Geophysics. Symposium on Monsoons dynamics. (YB n° 2788/2722)
Prof. M.P. Singh, Indian Institute of Technology. Hauikhas, New Delhi.

1977 Dec 5-9 Bangalore (India)
Documentation Research and Training Centre. Seminar and Sarada Ranganathan Lectures : Classification and indexing in the social sciences . Information for development planning.
DRTC. 112 Cross Road 11, Malleswaram, Bangalore 560 003, India.

1977 Dec 5-9 London (UK)
Inter-Governmental Maritime Consultative Organization. Marine environment protection committee, 6th session. (YB n° 1117)
101-104 Piccadilly, London WIV OAE, UK.

• 1977 Dec 5-16 Geneva (Switzerland)
UN Conference on Trade and Development Committee on Invisibles and Financing related to Trade, 8th session. (YB n° 3381)
Palais des Nations, CH-1211 Geneva 10.

1977 Dec 6-7 Geneva (Switzerland)
Int Organization for Standardization. 2nd meeting int information network for standards- management board (YB n°2314)
ISO. CP 56, CH-1211 Geneva 22.

1977 Dec 6-16 Budapest (Hungary)
Danube Commission. Réunion d'experts pour les questions de navigation et de radiocommunication. P: 40. (YB n° 464)
Benczur u. 25; H-1068 Budapest.

1977 Dec 7 London (UK)
Institute of Physics, Electronics Group. Meeting : Mechanisms and characterization of electronic noise.
Meetings Officer, The Institute of Physics, 47 Belgrave Square, London SWIX 8QX, UK.

1977 Dec 7-9 Strasbourg (France)
Council of Europe. Colloque sur ta Charte Sociale Européenne. (YB n° 435)
M Perin. Greffe, Conseil de l'Europe, avenue de l'Europe. F-67003 Strasbourg cedex.

1977 Dec 7-10 Marseille (France)
Meeting — Psychologie et cancer.
Prof X Serafino. Institut J Paoli - I Calmettes, 232 Blvd de Ste Marguerite, Marseille cedex 2.

1977 Dec 9-12 London (UK)
Int lighting conference ana trade fair.
Matthews and Corcoran Ltd, 16-17 Bride Lane, Fleet Street, London EC4Y 8EB.

1977 Dec 10-14 Jeddah (Saudi Arabia)
FAO. Regional seminar on institutional aspects of fisheries management and development, (YB *n°* 971)
Chief , Conference Programming Section . FAO , Via delle Terme di caracalla

I-00100 Rome.

1977 Dec 13-15 London (UK)
1st Int On-Line Information meeting.
On Line Review, Learned Information, Woodside, Hinksey Hill, Oxford 0X1 5BP, UK.

1977 Dec 14 London (UK)
Institute of Physics, Thin Films and Surface Group. On-day meeting : Ion sputtering and depth profiling in surface analysis.

The Meetings Officer, The Institute of Physics, 47 Belgrave Square, London SW1X BOX. UK.

1977 Dec 2nd or last week Lusaka (Zambia)
World Federation of Catholic Youth. African seminar for english-speaking Africa : Participation of young Christians in the struggle for African identity. P: 50. C: 15. Ex. (YB n° 3517)
WFCY-FMJC, avenue de l'Hopital Français 3l. B-1080 Brussels, Belgium, or : M Richard Sakala, Vice-Président for Africa, Zambia Times, Cavio Road, BP 394, Lusaka.

1977 Dec 16-19 San Juan (Puerto Rico)
2nd Caribbean symposium In anesthesiology and related fields.
Miguel Colon-Morales, MD, GPO Box 4547, San Juan.

1977 Dee 15-16 Strasbourg (France)
Council of Europe. Séminaire de synthèse sur le développement de l'éducation des adultes. (YB n° 435)
M Titz, DECS, Conseil de l'Europe, avenue de l'Europe, F-67008 Strasbourg cedex.

1977 Dec Accra (Ghana)
FAO. Seminar for market women leaders. (YB n° 971)
Chief. Conference Programming Section, FAO, Via delle Terme di Caracalla, I-00100 Rome.

1977 Dec Algiers (Algeria)

Unesco . World conference on national strategy and policies for informatics. (YB n° 3383)
Place de Fontenoy, F-75700 Paris.

1978 Jan 3-13 Sydney-Melbourne-Canberra (Australia)
Int Press institute. Annual general assembly. P : 250-300. C : 30. (YB n° 2375)
Tony Charlton Esq, Australian Assembly Co-ordinator, Ipl, • The Age », 250 Spencer Street, Melbourne 3000, Victoria, Australia.

1978 Jan 8-13 Cambridge (UK)
Int Bar Association, Energy and Natural Resources Committee of the Section on Business Law. Seminar : Petroleum law. P ; 150. C : 10. (YB n° 1396)
Int Bar Association, Bryon House, 7-9 St James's Street, London SW1A, 1EE.

1978 Jan 9-14 Freetown (Sierra Leone)
West African College of Surgeons. 18th Congress and conference : Genito-urinary surgery. P : 300. C : all west African countries. Ex. (YB n° 0167)
c/o Dr J T 0 Vincent, Connaught Hospital. Freetown.

1978 Jan 15-21 Amsterdam (Netherlands)
Int Association for the Exchange of Students for Technical Experience. General conference. P : 90. (YB n° 1280)
Mr Kochle. General Secretary, IAESTE, Ramistrasse 101, CH-8092 Zurich. Switzerland.

• 1978 Jan 16-19 Manila (Philippines)
Rehabilitation Int. 2nd Int conference on legislation concerning the disabled. (YB n° 2501)
Mrs Charlotte Flora, President, Philippine Foundation for the Rehabilitation of the Disabled, P O B 1215, Makati 3117, Rizal, Philippines.

1978 Jan 18-25 Bombay (India)
CHEM + TECH 2nd Trade fair and congress for the chemical and chemical

engineering industries.
Or D N Road, Taj Building 210, Bombay 400001. India.

1978 Jan 19-20 New Delhi (India)
World Psychiatric Association/Indian Psychiatric Society. Symposium : Treatment m psychiatry. P : 150. C : 13.
WPA, Maudsley Hospital. Denmark Hill, London SE5 8AZ, UK.

1978 Jan 19-21 Colombo (Sri Lanka)
Pacific Area Travel Association. Workshop. (YB n° 3042)
228 Grant Avenue, San Francisco, Cal 94108, USA.

1978 Jan 21-26 Brasilia (Brazil)
Organization for Flora Neotropica. Annual meeting of Board and commission, conferences (held in conjunction with II Latin American botanical congress) ; Progress In neotropical botany P ; 50 C : 10. (YB n° 4246)
Dr Ghjllean T Prance, Executive Director, OFN. The New York Botanical Garden, Bronx, NY 10458. USA.

1976 Jan 21-27 Milan (Italy)
Latin American Confederation of Tourlat Organizations. Extraordinary congress (promotional) : Tourism especially its development, from , within

and towards Latin America. P : 1200. C : 40. Ex, (YB n° 0396)
COTAL, Secretaria Permanente, Viamonte 640, 1053 Buenos Aires, Argentine.

1978 Jan 21-28 Sao Paulo (Brazil)
7e Convention Paulista d'Odontologie et 10e séminaire Latino-americain d'odontologie,
Associacio Paulista de Cirurgioes Dentistas , Rua Humanita , 389 , Sao Paulo.

1978 Jan 23-27 Strasbourg (France)
Council of Europe. Parliamentary Assembly. 29th session. 3rd part, (YB n° 0435)
Avenue de l'Europe, F-67006 Strasbourg cedex.

1978 Jan 25-27 Singapore (Singapore)
Int soy protein food conference. P : 500.
Pac-Asian SVCS (Pte) Ltd, Suite 1614 / 1616, Int Plaza Anson Road, Singapore.

1978 Jan 26 Tampa (Fla. USA)
Airport Associations Coordinating Council. 26th Meeting. (YB n° 4015)
AACC, POB 125, CH-1215 Geneva 15 - Airport, Switzerland.

1978 Jan Brussels (Belgium)
European Society tor Opinion and Marketing Research. Seminar on : Data analysis. (YB n° 0853)
ESOMAR, Raadhuisstraat 15, Amsterdam, Netherlands.

1978 Jan Kuala Lumpur (Malaysia)
Int Association of Seed Crushers. 541h World congress. P: 1000.
(YB n° 1343)
Oil Palm Growers' Council of Malaysia, Bangunan Getah Asli, Jalan Ampang, Kuala Lumpur.

• 1978 Jan (Israel)
Int Society for Horticultural Science, Section Vegetables. Symposium on water supply under glass and plastics. (YB n°2488)
Dr K M Schallinger, Inst. of Soils and Water, The Volcani Center, POB 6, Bet Dagan, Israel.

1978 Jan (Israel)
Liberal Int (World Liberal Union). Executive Committee meeting. (YB n° 2934)
I Whitehall Place, London SW1A 2HE, UK.

1978 Jan
Int Association of Professional Congress Organizers. 4th seminar on congress organization. P: 40. (YB n°1330)
rue aux Laines 1, B-1000 Brussels, Belgium.

1978 early (Malta or Spain)
Intergovernmental Océanographie Commission / FAO/ICSEM/United Nations Environment Programme. Int co-ordination group for the co-operative in-

vestigations in the Mediterranean. 3rd session.
(YB n° 1118/971/4161)
IOC, Unesco, Place de Fontenoy, F-75700 Paris.

1978 Feb 1 London (UK)
Institute of Physics, Electronics Group. Meeting : Real-Time computing in experimental physics.

Meetings Officer, The Institute of Physics, 47 Belgrave Square, London SWIX 8QX, UK.

1978 Feb 8-10 Los Angeles (Cal, USA)
Center for Management Education, Graduate School of Business Administration, University of Southern California. Workshop : Futures research techniques tor corporate planners.
Reservation Manager, University Hilton Hotel, 3540 South Figueroa Street, Los Angeles, Cal 90007.

1978 Feb 15-16 Brussels (Belgium)
Int Institute for Sugar Beet Research. Winter congress : Sugar beet research. P : 200. (YB n° 2132)
IIRB, rue de la Science 10, B-1040 Brussels.

1978 Feb 20-25 Manila (Philippines)
Intergovernmental Océanographie Commission. Int Co-ordination Group for the Tsunami Warning System in the Pacific. Meeting. (YB n°1118)
Secretary IOC. Unesco, 7 de Fontenoy, F-75700 Paris, or : ITIC. POB 383D, Honolulu, Hawaii 96S12, USA.

1978 Feb 21-24 Brussels (Belgium)
Association des Informaticiens de Belgique. Congrès : Sommes-nous prêt à maîtriser les problèmes techniques, humains et économiques de l'informatique de demain ?
ASAB, rue J Cuylitsstraat 39, Bte 4, 8-1180 Brussels,

1978 Feb 22 Berlin (East)
World Federation of Democratic Youth . 10th General assembly.

(YB n°3519)
FMJD, Ady Entre utca 19, Budapest II, Hungary.

1978 Feb 23 Paris (France)
Int Prevention of Road Accidents. Round Table ; Alcohol-drugs and driving. P: 200. (YB n°2377)
PRI, Avenue G Boillot, Linas, F-91130 Monthlery, France,

1978 Feb 24-26 Lahore (Pakistan)
2nd Psych, conference on anxiety, depression, schizophrenia, drug dependence and rehabilitation of mentally ill in developing countries.
Fountain House, 37 Lower MAM, Lahore.

1978 Feb 25-Mar 1 Madrid (Spain)
Int Association Of Professional Congress Organizers. General assembly and workshop. P : 25. (YB n° 1330)
rue aux Laines 1, B-1000 Brussels, Belgium.

1978 Feb Boston (Mass, USA)
Michael A Keller, Music Librarian, Lincoln Hall, Cornell University, Ithaca, NY 14853, USA.

1978 Feb Brussels (Belgium)
Int conference on Trans-National data regulation.
Online, Cleveland Road, Uxbridge UB8 2DD. UK.

1978 Mar 6-10 Cleveland (Ohio, USA)
29th Conference on analytical chemistry and applied spectroscopy.
Dr E S Hodge, Society for Analytical Chemists of Pittsburgh, Mellon Inst., 400 Fift Avenue, Pittsburgh, PA 15213, USA.

1978 Mar 8 -10 Toulouse (France)
European Space Agency /Centre National d'Etudes Spatiales. Int conference : Earth observation from space and management of planetary resources. Ex. (YB n° 868)
OST, BP n°4130, F-31030 Toulouse cedex.

1978 Mar 8-17 Manila (Philippines)
Indo-Pacific Fisheries Council. 18th Session includes the symposium on fish utilization, technology and marketing in the IPFC region. P : 100. C : 18. (YB n° 1023)
Indo - Pacific Fisheries Council , FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Road Bangkok 2, Thailand.

1978 Mar 12 Duisburg (Germany, Fed Rep)
European Table Tennis Union. Biennial general meeting. P : 60-70. C : 33. (YB n° 0872)
Deutscher Tisch Tennis Bund, Souchaystrasse 13, 6000 Frankfurt/Man. Germany, Fed Rep.

1978 Mar 13-24 Budapest (Hungary)
Danube Commission. Ordinary session. P: 100. (YB n° 0464)
Benczur u. 25, H-1068 Budapest.

1978 Mar 14-16 San Francisco (Cal, USA)
« Coastal Zone 78 " Conference : Coastal zone management, beneficial use, protection, and development...
Mr Orville T Magoon, Chairman, Waterways. Port, Coast and Ocean Technical Group, San Francisco Section, American Society of Civil Engineers, POB 26062, San Francisco. Cal 94126.

1978 Mar 15-16 Paris (France)
European und Mediterranean Plant Protection Organization. Working party : Fumigation standards. (YB n° 0544)
1 rue Le Nôtre, F-75016 Paris.

INBEL

• 1978 Mar 18-23 *Las* Palmas (Canary Islands, Spain)
Association for the Taxonomic *Study* of Tropical African Flora. 9th Plenary meeting : The taxonomic aspects of economic botany (furthermore : progress reports, mapping, conservation etc.). P: 200. C: 30. (YB n°114)
Secr. Gen. G. Kunkel, Laboratorio de Botanica. Excmo. Cabildo Insular, Las Palmas de Gran Canaria, Spain.

1978 Mar 19-24 Norman (Okla, USA)
American Crystallographic Association. Spring meeting.
Dr M H Mueller, ACA Secretary, Building 212, Argonne National Laboratory, Argonne, IL 60439, USA.

1978 Mar 25 -28 Rio de Janeiro (Brazil)
American Colloque of Chest Physicians. 2nd Pan American congress on diseases of the chest : Cardiopulmonary medicine and surgery.
(Y
B n° 0047)
Prof Jesse P Teixeira, Caixa Postal 370, ZC-00, Rio de Janeiro, GB.

1978 Mar 26-30 Riyad (Saudi Arabia)
Int Association for Advancement of Earth and Environmental Sciences / University of Riyad. 1st World congress on resource depletions, energy alternatives and the quality of life in the year 2000. (YB n° 4743)
Dr Musa Qutub, dept. of Geography and Environmental Studies, Northeastern

1978 Mar 28-Apr 7 Nijmegen (Netherlands)
Int Council of Associations for Science Education/Int Council of Scientific Unions/Unesco. Int conference on integrated science education worldwide. (YB n° 4758/1752/3383)
Frits Dekkers, Faculty of Science, University of Nijmegen, Netherlands.

1978 Mar 20-Apr 18 Graz (Austria)
Workshop on modern library and information practice.
Austrian Federal Ministry for Science and Research, Schenkenstrasse 4, A-1074 Vienna.

1978 Mar 30-Apr 1 Copenhagen (Denmark)
Scandinavian Society of Psycho pharmacology. Congress. P : 330.
c/o Mr Bo Sylwan, Raubergagatan 47, S-212 30 Malmo, Sweden.

1978 Mar 30-Apr 2 London (UK)
Int conference on toy libraries. P : 200.
Ms Leslie Moreland, Toy Libraries Association, Sunley House, Gunthorpe Street, London El.

1978 Mar Kuala Lumpur (Malaysia)
2nd Islamic Bank conference. P: 300.
Treasury Jalan Raja, Kuala Lumpur.