COMPUTER CONFERENCING

AND THE

TRANSFER OF INFORMATION

CONFÉRENCES PAR ORDINATEUR

ET

TRANSFERT DE L'INFORMATION

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ABSTRACT

The role of meetings and symposia in information transfer is increasingly being called into question as a result of such factors as the rising costs of travel and the necessity of conserving fuel. The technique of computer conferencing has been developed as a possible alternative to the practice of bringing together people from widely scattered locations for a few hours of personal interaction. The authors discuss the advantages, disadvantages and costs of computer-moderated interaction, as well as the potential implication for information systems and networks.

RÉSUMÉ

Le rôle des réunions et des colloques est de plus en plus remis en question sous l'influence de facteurs tels que le coût sans cesse croissant des déplacements et l'obligation d'économiser le carburant. Les conférences par ordinateur seraient le réponse au problème, car il ne serait plus nécessaire de regrouper les gens, venant parfois de fort loin, pour qu'ils puissent procéder à des échanges de vues relativement brefs. Les auteurs discutent des avantages, des désavantages et du coût d'un tel système, ainsi que des répercussions probables sur les ordinateurs et les réseaux informatisés.

COMPUTER CONFERENCING

The Need

The Rt. Hon. W.L. MacKenzie-King is said to have remarked that, while England is troubled by having too much history, Canada's problem is too much geography. The truth of this statement is painfully evident to associations of specialists. Occasionally, a dramatic illustration of this will occur, such as the postponement of the Second Canadian Conference on Information Science because of labour disputes affecting mail and air transport. More often, however, the problem is that of small, mission-oriented groups of experts being forced either to confine their membership to persons who are located reasonably close together or to resign themselves to coping with the vagaries of the postal system, supplemented by the occasional telephone call and by meetings. Unfortunately, meetings must be planned well in advance, take the conferees away from their everyday duties and are seldom of either sufficient duration or frequency to allow effective interchange among participants. Furthermore, such meetings are becoming increasingly subject to problems arising from labour disputes, inflation, fiscal restraint and the whims of Arabian emirs.

In view of these problems, which are by no means unique to Canada, the search has begun for viable alternatives to face-to-face meetings of experts in a field of endeavour. Davies and Shore (1974) mention the following possibilities:

1. Telephone and TWX conferencing

2. Television conferencing

3. Computer conferenceing

The limitations of the first two categories include the relatively small size of groups that can be handled effectively and the high cost of communications links or of required equipment. Moreover, while television and telephone conferencing requires the participation of all conferees simultaneously, TWX, which does not involves either cumbersome one-to-one transactions or the use of a switched network which is not readily adaptable to this purpose. These factors, inter alia, make telephone, TWX and television conferencing largely impracticable for ongoing use especially in an international environment. The remainder of this paper will, therefore, be concerned with computer conferencing.

The Concept

Perhaps the simplest way of approaching the concept of computer conferencing is to compare a computer conference with a typical meeting or symposium. In the latter case, an individual will, upon his arrival, consult the conference directory to learn which subjects are being discussed, what facilities are available, and other information about the conference.

He may then choose to participate in seminars, subcommittees or special interest groups; or he may attend a plenary session at which questions are discussed and voted upon. At times, he may choose to retire to a private working area to consult his own information files, as well as those belonging to the conference generally, between (or even during) sessions or seminars.

An individual participating in a computer conference operates in an analogous manner. After he has been instructed, by means of a tutorial program or participant's manual, regarding the nature and use of the available facilities, he may exchange messages with all conferees (plenary session) as well as with designated subgroups (seminars). This interchange is asynchronous and is facilitated by a program feature which allows each participant, upon entering the system, to receive all messages sent since his last entry. Voting, by means of a Delphi technique, is likewise asynchronous. As an additional feature, participants may generate their own computer-stored and indexed files to assist them in dealing with conference-related matters. The entire system is under the control of a conference monitoring program, which acts in the manner of a conference secretariat, authorizing new conferees, submitting propositions to the group for voting, keeping statistics, and performing the necessary maintenance and modification of the conferencing system.

The use of computer conferencing techniques on a national scale has been described by Turoff (1972), Davies and Shore (1974) and Millard and Williamson (1976), and a number of national conferences using this mode of interaction are currently in progress under the auspices of the Institute for the Future in Menlo Park, California. Kollen and Vallee (1974) report on an international computer conference involving Canada and the United States, and the existence of international computer networks offering local dial-up access in many countries, e.g., the networks established by General Electric and by I.P. Sharp, make transoceanic computer conferencing a definite possibility.

Benefits

The advantages of computer conferencing are numerous. Conferees are not required to abandon their normal occupation for days or weeks at a time or to travel to distant locations; they remain, rather, at their own work sites and interact asynchronously as their regular duties allow. The asynchronous nature of interaction also allows participants to consult local experts at their leisure or, on the other hand, to interject ideas into an ongoing discussion without interrupting it. Participants are, of course, provided with a full transcript of all "proceedings". Perhaps one of the most attractive features is that, once the required software is in place, the ease of initiating a computer conference allows rapid, efficient and economical handling of matters arising between meetings.

Indeed, the costs involved in computer conferencing are quite attractive. Turoff (1972) reports such a conference which lasted thirteen weeks and involved twenty conferees. The total cost was approximately

$1,500. Given that no capital outlay was required and that local dial-up access was available, figures for a similar conference on an international level should be of the same order of magnitude. This compares favourably with the costs which would be involved in bringing twenty widely-dispersed people together at a conventional conference for even a short period of time. Turoff (1976) discusses the economics of computer conferencing in more detail.

Problems

There are, of course, disadvantages entailed by computer conferencing. Not the least of these is that the elimination of face-to-face contact removes from the interpersonal communication process a certain intangible but important element. For this reason, computer conferencing may reduce the requirement for, and the frequency of face-to-face meetings but will never totally replace them. This area is one in which television conferencing might, perhaps, find application.

Another possible disadvantage is the multiplicity of languages involved in an international conference. Participants in a computer conference would be required to make their own arrangements for translation of texts which were in unfamiliar languages. Since conferees may interact at their own respective rates, this is not as great a problem as it may seem at first sight. Also not to be overlooked is the factor of "passive multi-lingualism", i.e. the ability to read a language in which one cannot converse or write. The authors hypothesize that this factor should make computer conferences as comprehensible to all participants as the proceedings at conventional conferences, without the costs entailed by simultaneous translation of several languages. Nevertheless, consideration must be devoted to this matter when establishing a computer conference, especially one involving countries which use non-Roman alphabets.

Despite these disadvantages, the technique of computer conferencing would appear to offer a significant potential for exploitation by international organization, and especially by technical committees and special of interest groups of such organizations. Specialists, freed from the necessity of limiting their collective consideration to a few topics that can be covered in two or three days of meetings per year, can devote their common attention to matters which are of global importance and which require more extensive discussion.

Applications

The most immediate potential for the application of computer conferencing in the field of information transfer may be as a complement to national and international bibliographic files or data banks. Especially in the case of developing nations, which are intended to be among the major beneficiaries of such systems as *AGRIS and **DEVSIS, locally available

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* AGRIS - Agricultural Research Information System
** DEVSIS - Development Services Information System

expertise may not be sufficient to exploit fully the potential utility of these systems. A computer conferencing facility would enable users in the Third World to consult with their colleagues in the industrialized nations, on an ongoing basis, regarding matters arising from the information retrieved from the data bases.

The more developed nations will also be able to benefit from this technology, since no country has a monopoly on expertise. If, for example, the principal investigators in a particular field were located in Vancouver, Hamburg, Minsk and Canberra, they would be able to form a research team, coordinate their efforts, and act largely as if they were all in the same city.

The Primary obstacles to the exploitation of computer conferencing at this time are the diffusion of effort and governmental policy. At the present time, research in this field consists largely of individuals creating conferencing systems tailored to the needs of specific organizations. The resulting "one-off" systems may not be compatible with the equipment or operational requirements of other user groups.

Furthermore, developments in the United States have been somewhat constrained by the possibility that the use of computers for conferencing purposes may, under certain circumstances, be subject to Federal Communications Commission regulations for common carriers (1973, 1976). Although Canadian regulatory authorities have taken no firm position on this matter, the Government's position statement on computer communications policy (1973) makes the situation of computer conferencing dubious, to say the least. Until the issue of regulation is resolved satisfactorily, the use of this communication modality may be restricted to organizations that can use dedicated circuits connected to their own computer.

Should the policy of the United States government change, the next logical step would be for a service bureau, operating in a manner analogous to Lockheed Information Services or Systems Development Corporation, to offer dial-up access to a conferencing system which would allow users to define their own groups of conferees, provide necessary software systems for carrying on the conference, and bill users on a pay-as-you-go basis. Such a system, to be commercially viable, should have the following characteristics:

1. Widespread availability of local dial-up access.

2. Sufficient flexibility to meet the requirements of users possessing varying degrees of sophistication.

3. Reasonable pricing structure.

Given the above characteristics, a supplier of this type of service, other things being equal, should be able to capture the market, since users would prefer to be associated with the clearinghouse having the greatest number of potential conferees and, concomitantly, the largest base of financial support.

The possibilities for future development along these lines are manifold. A conferencing system which allowed conferees to store and run executable programs would enable, among other things, the cooperative building of simulation models. Physicians, confronted with difficult cases, could consult colleagues throughout the world at a minimal cost, using graphics terminals to present EKG patterns, X-ray photographs, and similar data.

The heart of the matter is that it is no longer sufficient for suppliers of information services merely to deliver to their users a mass of relevant facts, figures, and citations. To do this, and nothing more, rather than alleviating the problems caused by the information explosion, makes them more apparent to the end user. Einthoven and Smith (1972) define information as "data plus analysis". The technique of computer conferencing, properly applied, can play a significant role in the provision of the type of analytical capability that will be required of information systems in the future.

REFERENCES

CANADA, MINISTRY OF COMMUNICATIONS 1973
Computer/communications policy; a position statement by the Government of Canada.
Ottawa, Information Canada.

DAVIES, M. and B. SHORE 1974. Computer mediated interaction --- computer conferencing and beyond.
Telesis 3(7) : 205 - 211.

EINTHOVEN, C., and J. VALLEE eds. 1974 Proceedings of the first international computer-based conference on travel/communication relationships.
Montreal, Quebec; and Menlo Park, California;
Business Planning Group, Bell Canada; and the Institute for the Future.

MILLARD, G., and H. WILLIAMSON 1976. How people react to computer conferencing.
Telesis 4(7) : 214 - 219.

TUROFF, M., Delphi conferencing: computer-based conferencing with anonymity.
Technological Forecasting and Social Change 3:159-204.

_____1976. The cost and revenues of computer conferencing. Third International Conference on Computer Communication, Toronto. 214-221.

U.S., FEDERAL COMMUNICATIONS COMMISSION 1973.
Participation in data processing by common carriers in its Rules and regulations, section 64.702(g).
47 CFR 64.702(g).

_____ 1976 Notice of Inquiry and proposed rule making in the matter of amendment of section 64.702 of the Commission's rules and regulations, Docket no. 20828.

VALLEE, J., et al. 1974 Group communication through computers; Vol. 1, design and use of the FORUM system.
Menlo Park, Institute of the Future.

APPENDIX:

Comparative Features of Group Communication Techniques*

PARAMETERS OF COMMUNICATION	UNAIDED FACE-TO-FACE	RECORDED CONFERENCE CALL	RECORDED VOICE VIDEO	COMPUTER CONFERENCE
Effective group size	Small to large	Small	Small	Small to large
Maximum number of sites	One	Five	Two	Number of ports to computer
Occurrence of interaction by individual	Coincident with group	Coincident with group	Coincident with group	Random
Length of Interaction	Long	Short	Short to medium	Short
Number of interactions	Single	Multiple, as required by group	Multiple, as required by group	Multiple, as required by individual
Availability of accurate record	No	Possible	Possible	Yes
Sensitive to technical failure	No	Slightly	Slightly	Yes
Can preserve anonymity	No	No	No	Yes
Can aggregate numerical data	No	No	No	Yes
Costs (commercial rates, 1974)	12¢ per mile and $100 per day for each participant	Phone charges	$390 per hour**	$15 - 60 per hour

* Adapted from Turoff (1972) and Vallee (1974)
** Based on Chicago-New York rate of $6.50 per minute for conference Picturephone service.

PARAMETERS OF COMMUNICATION	UNAIDED FACE-TO-FACE	RECORDED CONFERENCE CALL	RECORDED VOICE VIDEO	COMPUTER CONFERENCE
Other characteristics	Force delays between meetings	Time urgent considerations		Time urgent considerations
	Efficient flow of information from few to many	Equal flow of information to and from all	Equal flow of information to and from all	Equal flow of information to and from all
	Can maximize psychological and emotional effects			Can minimize psychological and emotional effects
				Can minimize time demanded of conferees