

LES COLLABORATOIRES

By A. Jack Meadows

General background

Considerable effort is currently going into the development of computer-supported cooperative work (CSCW). (The term itself was coined in the USA in 1984). CSCW aims to augment group effectiveness by using enabling technology. The two main areas of investigation in CSCW are: 1) group effectiveness in using information technology; 2) what information technology is appropriate.

Group effectiveness in using Information Technology

- 1) Understand the needs of each individual
- 2) Understand how individuals work together
- 3) Understand the organisational context within which individuals and groups work

Requirements of Information Technology

- 1) Interactive communication
- 2) Shared information systems (e.g. databases)
- 3) Support for group activity - often called Group Decision Support Systems (GDSS)

As this list indicates, electronic collaboration between researchers is simple one form of CSCW. Most CSCW studies so far have been carried out in the industrial/business context (especially via EC programmes), but there should be spin-offs for the research community (both in terms of guidelines and groupware). However, such spin-offs have not yet been investigated in any detail.

Networking use

Increasing use

The growth of electronic networks has led to rapid increases in communication

Mr Meadows's paper was delivered at the Seminar "Changing roles in the information chain" organized by the British Library of Political and Economic Science and the International Committee for Social Science Information and Documentation, London, United Kingdom, 30. March 1993.

between researchers. For example, the table below shows the growth in activities by academic scientists in the UK as a result of increased access to JANET from the desk-top. (Similar increases are also under way in the social sciences and humanities.) As can be seen, activities such as analysis of data and word processing, which do not require access to a network, were already well advanced in 1986. The effect of introducing networking can be seen in, for example, the growth in use of electronic mail between 1986 and 1991.

Use of Information Technology by British academic scientists

Computer Activity	% of Scientists involved	
	1986	1991
Collection of data	40	54
Analysis of data	55	72
Graphical display	59	87
Word processing	62	96
Electronic mail	16	70
Electronic data exchange	8	38
Academic bulletin board	1	23
Searching an online database	28	58
Electronic diary	1	17
Personal bibliographic database	20	39
Personal non-bibliographic database	22	39

Studies carried out, especially in the USA, on computer-mediated communication (CMC) - which is itself a branch of CSCW - indicate that there are significant differences in communication habits as compared with traditional forms of communication. This means that the social system that best suits an electronic communication environment may not be the same as that which is appropriate for tradi-

tional communication. For example, there is some evidence that an electronic research 'clique' is not identical with a traditional 'invisible college'.

Changes from traditional to computer-mediated communications

- Content of messages becomes less formal
- Participants are less constrained by group norms
- Lack of user training is often a problem
- Low-level faults in the system affect motivation greatly
- Status differences between participants are reduced
- Encourages the development of research 'cliques'

Informal and formal communication

In terms of traditional channels, there is a clear distinction between informal and formal communication, but one CMC channel can mix both components in a continuous spectrum, as shown in the table below. (It is worth noting that fax is providing a popular intermediate channel between traditional and computer-mediated communication, and may soon become available on personal workstations along with electronic mail.)

Types of CMC in the research community

General discussion	More informal
Work messages	
Newsletter	
Conferencing	
Draft papers	
Abstracts journal	
Referred journal	More formal

Informal electronic communication (e.g. electronic mail, bulletin boards) has dominated research developments until recently: now a move to formal communication via electronic journal has begun. The recent launch of the *Online Journal of Current Clinical Trials* has probably been most reported, but many other initiatives are under way. The title of a new electronic journal is shown below as an example. It is worth noting that current studies at Loughborough suggests that researchers want an electronic journal, at least initially, to resemble as closely as possible the printed journal with which they are already familiar.

The reasons for moving to an online journal can be understood in terms of the deficiencies of traditional journals, listed below. Note that not all of these will be

automatically solved by moving to CMC. For example, it is actually more difficult at present to monitor electronic material than printed material.

Problems of traditional journals

- The failure to publish papers promptly
- Limitations on the lengths of papers
- Proliferation of journals
- The cost of journals
- Difficulty of monitoring the material available

It is worth emphasizing here that these developments are in no way limited to science. Thus the current online availability of an illustrated exhibition catalogue from the Library of Congress in Washington is of importance for research by art historians and museum specialists.

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1. Letter from the Publisher

IPCT-J Readers,

Welcome to the first issue of IPCT! It is almost one year ago this week that the idea for this electronic journal was first conceived.

I was hired by Georgetown University in January 1992, in part, to direct the Center for Teaching and Technology (CTT) at the Academic Computer Center. Simply stated, the mission of the Center is to promote the integration of com-

puters and other instructional technology in the higher education classroom. Within that framework is included the vision of tapping the expertise available from scholars throughout the world, to discuss their common interests, to learn from one another, to share their expertise and to pool their experience toward the solution of common problems.

In the course of discussion we decided that a scholarly peer-reviewed journal could be a valuable part of promoting the mission of the CTT. As we continued to articulate this idea, we thought that an electronic journal distribution might be the most immediate and practical way of implementing this goal. To that end, a scholarly discussion group (SDG) was created to help in finding of an editorial board, potential contributors and subscribers. The original list announcement commented on this goal:

Besides creating a forum for the topics of interest noted above, another interest of the CTT is to publish a scholarly, refereed international journal. To that end, the IPCT-L will develop a subscription list and act as a resource to develop the community necessary to review articles and recommend editorial policies as these publishing goals move forward.

It is with pride and a sense of accomplishment on the part of many persons that I announce this first issue of the Interpersonal Computing and Technology Journal.

Limitations

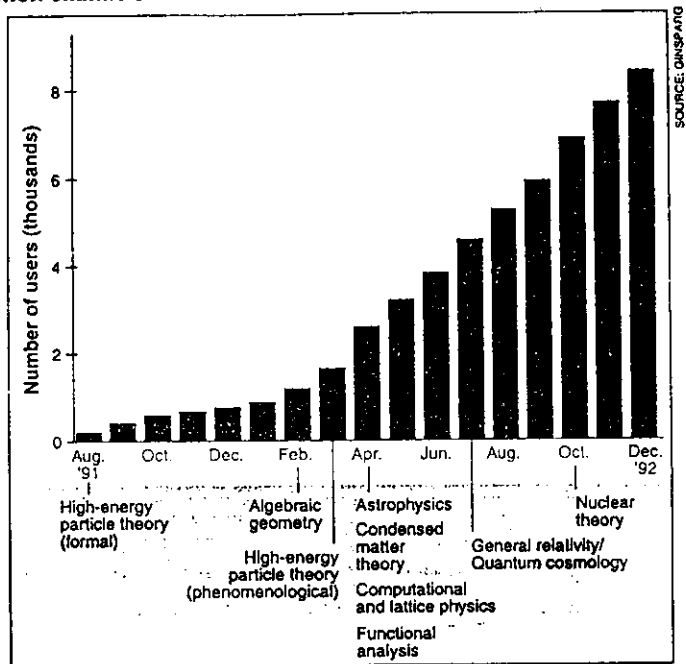
A US investigation of information technology and the conduct of research came up with a list of impediments to the use of CMC by researchers. These relate to the infrastructure, more than to the researchers. Thus, researchers are accustomed to free network access, so how can publishers best charge for their electronic products? Note, however, that the question of the quality of electronic information is very important to researchers.

Impediments to the use of CMC by researchers.

- Issues of cost and cost sharing
- The problem of standards
- Legal and ethical aspects
- Gaps in training and education
- Risks or organisational change
- Lack of an adequate infrastructure
- Quality control

Researchers' concerns

These worries about quality control are worth underlining. For example, pre-prints are increasingly becoming electronic: in the physics community, some researchers are coming to rely primarily on pre-print bulletin boards for publication and information. The growth in this activity is shown in the diagram below. The 'cold fusion' controversy was an instance where most of the discussion went on electronically: since the rise and fall of the topic only spanned a year, the timescale of printed journals was too long. Another concern is access - the current electronic research community consists primarily of American males. There is an important need here to facilitate use by other groups, especially in developing countries. A further problem is one of acceptance. Thus senior academics are often less involved in CMC than their juniors, but they are the people who decide on the funding of hardware/software and the acceptability of different communication channels.



Physicists tap in. As bulletin boards have been added, the total number of users has grown. A dozen more subdisciplines are in the works.

Development of CMC for researchers

Researchers are more interested in information than in the channels which provide the information. However, there is always a pay-off between the value of information and the ease or otherwise of acquiring it, as is shown in the table below. It is clear that ease of access is actually more important for the use than in the relative usefulness of the information.

Hence, the first requirement for electronic communication is that the infrastructure should be immediately available (e.g. a reliable networked workstation on the desk).

Usefulness of information versus ease of access

Information source	Relative usefulness	Frequency of usage (perweek)
Library	8	3
Personal discussions	8	8
Telephone conversations	7	10
Electronic mail	6	15

Given that this infrastructure exists, then from the viewpoint of developing international computer-based activities (e.g. bulletin boards, newsletter, journals), it is necessary to establish next which research topics are both strongly supported and of international interest. For example, some social sciences are strongly supported in France, but are not always widely known internationally. Could electronic dissemination help here? This can be divided down into a series of more detailed questions. The first, again, is - does the relevant social science community have immediate access to workstations either within France, or elsewhere?

In general, it is clear that the rapidly increasing provision of high-speed networks to researchers is facilitating change from printed to electronic distribution of information. The leading publishers of research are therefore now beginning to take electronic disseminations seriously. There is room for new experimentation here, that was not possible with traditional printed channels. But, if it is to broaden the process of research, it must be based on systematic and long-term planning.

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