The Written World:
On the theory and practice of computer conferencing

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Chapter 2

TEXTUAL MEDIATIONS

Writing and Personal Presence

In our culture the face-to-face encounter is the ideal paradigm of the meeting of minds. Communication seems most complete and successful where the person is physically present 'in' the message. This physical presence is supposed to be the guarantor of authenticity: you can look your interlocutor in the eye and search for tacit signs of truthfulness or falsehood, where context and tone permit a subtler interpretation of the spoken word.

Plato initiated our traditional negative view of the written word. He argued that writing was no more than an imitation of speech, while speech itself was an imitation of thought. Thus writing would be an imitation of an imitation and low indeed in the Platonic hierarchy of being, based on the superiority of the original over the copy. For Plato, writing detaches the message from its author and transforms it into a dead thing, a text. Such a text, however, can cross time (written records) and space (mail), acquire objectivity and permanence, even while losing authenticity (Derrida, l972a). That we still share Plato's thinking about writing can be shown in how differently we respond to face-to-face, written, typed and printed forms of communication. These form a continuum, ranging from the most personal to the most public.

The new phenomenon of computer mediated communication (CMC) appears to represent a dramatic step toward total impersonality. For example, authorship seems drastically reduced when messages entered into the computer's memory
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are accessed in accordance with the recipient's interest rather than the writer's agenda.

But is it true that CMC is a sterile imitation of thought, devoid of the personal touch? Computer bulletin boards, electronic mail, computer conferencing, videotex and synchronous dialogue programs are now employed by millions of people all over the world. Yet experienced users of the new medium usually deny that it obstructs human contact. It turns out that many ordinary individuals possess a compensatory 'literary' capability to project their personality into writing destined for the computer screen.

The strangest thing about CMC is not its purported inhumanity, but rather its lively, rapid iterations, almost rapid enough to recall spoken conversation. The speed with which messages are exchanged makes it possible to use computer communications to manage a project, say, or teach a class, or meet new people. With practice, the computerised mediation of such pursuits comes to seem a normal part of daily life.

Yet no matter how thoroughly we banalise the on-line environment it remains unpredictable and surprising because it violates many deeply ingrained cultural assumptions we make about communication. For example, we may no longer assume that writing is more formal and less personal than speech. This and other strange consequences must be taken into account in any on-line setting.

The core of the new CMC medium is computer conferencing, which makes it possible to create discussion groups with access to a topic of mutual interest. Typed messages are transmitted over phone lines to a central computer where they are classified and stored. Participants 'sign on' at times of their own choosing, using the central computer as a 'meeting place' for an 'asynchronous' conversation that may last weeks or months. Life in such a 'written world' gives rise to many unfamiliar problems and possibilities.

Communication Anxiety

Engaging in face-to-face conversation involves complex forms of behaviour called 'phatic' functions by semiologists. When we say "Hey, how's it going?" we signify our availability for communication. We usually close the conversation with another set of rituals, such as, "I've gotta go. See you later." Throughout our talk, we are continually sending phatic signs back and forth to keep the line open and to make sure messages are getting through. For example, we say such things as, "How about that!" or reply, "Yes, go on." Looks and facial expressions tacitly reassure interlocutors that they are still in touch, or on the contrary carry a warning if the communication link is threatened by technical difficulties or improprieties. All such phatic signs are bypassed in computer conferencing. Even standard codes for opening and closing conversations are discarded.

Communicating on-line involves a minor but real personal risk, and a response - any response - is generally interpreted as a success while silence means failure. Additionally, the sender of a message needs to know not only that it was received, but how it was received. It is disturbing to do without nods of
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the head, smiles, glances, tacit signs which in everyday conversation often take the place of words. An on-line acquaintance once wrote me that he found himself "almost begging this machine to recognise me." The paucity of phatic expression in CMC amplifies certain social insecurities that no doubt were always there, but which now come to the fore.

The problem is aggravated by the asynchronous character of the medium. Here, computer conferencing resembles letter writing, another medium in which phatic functions are quite weak. It is less rude to leave a letter unanswered than to refuse to reply to a direct question in face-to-face conversation. Similarly, if we fail to answer an on-line message, it is without the embarrassment we would certainly feel were we to ignore an acquaintance on the street. But a poor correspondent may be excused because of the delay and uncertainty of ordinary mail, while CMC messages are never 'lost in the

mail'. They are lodged instantly in the central computer. As a result when we leave a message in computer memory we feel an intense need for response.

This technical improvement, which makes rapid exchanges possible, also makes unusual delay a sign of rejection or indifference since there is no mechanical excuse for silence. Paradoxically, then, speeding up and improving asynchronous exchanges causes unexpected distress. This explains why on-line communities place such an emphasis on active participation and are often critical of passive readers who are pejoratively called 'lurkers'. This concern with participation may even become obsessive, revealing the surprising depths of anxiety of unrequited authors.

The Management of Identity

Computer conferencing is one of several new technologies which create novel forms of identity. Electronic bulletin boards, dialogue systems and computer conferences present their users to each other only through explicit written language. When writing, it is easier to choose a tone and attitude than it is in speech, dress and gesture. The social subject is profoundly modified by the generalisation of such highly controlled forms of self-presentation. The written 'I' is not the same 'I' who appears in face-to-face encounters. This new 'I' has increased its distance from the world and itself.

An extreme form of self-definition occurs in 'chatting' systems, where people make dates through an exchange of pseudonymous messages. These systems represent an interactive form of classified personal advertisement. In France, where such systems have developed on a large scale, this is a popular way to meet people (Marchand, 1987; Bruhat, 1984). [2]. As with newspaper 'personals', lonely individuals have the impression they fully command all the signals they emit, unlike risky face-to-face encounters where such control is difficult and uncertain. Thus the use of writing makes possible elaborate identity games. As Claude Baltz (1984, p 185) writes, 'instead of identity having the status of an initial given (with which the communication usually begins), it becomes a stake, a product of the communication.'
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The experience of pseudonymous communication calls to mind Erving Goffman's (1982, p 31) double definition of the self as an 'image' or identity, and as a 'sacred object' to which consideration is due: 'the self as an image pieced together from the expressive implications of the full flow of events in an undertaking; and the self as a kind of player in a ritual game who copes honorably or dishonorably, diplomatically or undiplomatically, with the judgmental contingencies of the situation.' By increasing the individuals' control of image, while diminishing the risk of embarrassment, computer talk alters the sociological ratio of the two dimensions of selfhood and opens up a new social space.

The relative desacralisation of the subject weakens social control in computer-mediated communication. It is difficult to bring group pressure to bear on someone who cannot see frowns of disapproval. Communication by computer thus enhances the sense of personal freedom and individualism by reducing the 'existential' engagement of the self in its communications. 'Flaming' (the expression of uncensored emotions on-line) is viewed as a negative consequence of this feeling of liberation. And so is the diminished sense of the reality of other people.

Chatting systems, like 'hacking', (Turkle, 1984) are bizarre social innovations that accompany and subvert the mainstream of technological innovation on which they depend. Marc Guillaume (1982, p 23) has introduced the concept of 'spectrality' to describe these new forms of interaction between individuals who are reduced to anonymity in modern social life, and yet succeed in using that anonymity to shelter and assert their identities.

The Relationship to Discourse

These changes in the management of identity take on their full significance against the background of changes in the role of language in CMC. A group which exists through an exchange of written texts has the peculiar ability to recall and inspect its entire past. Nothing quite like this is available to a community based on the spoken word. The modification of language by CMC can best be understood as a new variety of 'social memory' comparable to such other mediated memories as storytelling, books, and mass communications. Each medium supports recall of the past through different types of 'iteration', with different social implications (Derrida, 1972b; Goody and Watt, 1968).[3]

We can distinguish generally between retrievable and repeatable discourse. Retrieval involves access to a permanent text, such as a book or diskette. In principal there is no reason why such access should not be entirely under individual control since the technologies of retrieval do not require the presence of other human beings. Texts 'stored' in human memory, however, are 'accessed' through 'repetition' or performance. In cultures which rely heavily on repetition of basic texts, the function of performance is frequently assigned to special individuals, and access to the text is not under individual control but regulated socially through participation in public functions and audiences.
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There is a long theoretical tradition of study of the relation between 'oral' and 'literate' cultures in which retrieval is identified with writing, and repetition with speech. But today the difference between retrieval and repetition no longer correlates neatly with the distinction between writing and speech: answering machines routinely present us with speech as a retrievable text, computer dialogue systems allow synchronous written conversation, and sophisticated phonemail systems and computerised voice management technology, and will soon shift the balance toward retrievability in all domains. This shift has remarkable social implications.

It has only been a short while since Marshall McLuhan announced the end of literate culture and the rise of a new 'oral' culture based on electronic broadcasting. Certainly McLuhan was right in identifying a steady devaluation of the written word in modern societies. Recent years have seen the proliferation of remedial writing courses in colleges and the gradual decline of the childhood pastime of reading for pleasure. In this context, computer-mediated communication seems to promise that writing will once again become a universal form of expression.

One powerful hypothesis about modern individualism holds that it grew with the emergence of printing and literacy - what I have called retrievable forms of discourse (McLuhan, 1964; Ong, 1977). The spread of written discourse fosters the corresponding spread of a new subjectivity: the eye (I) of the reader is an individual. The organic community of speech, based on repetition and performance, gives way to the privacy of the modern individual, suddenly distanced from the language of the community. In this

new position the individual gains control of a personal language, which is 'doubled' because the speaker/writer is no longer identified with his own words but uses them for 'effect'. This distance is the essence of modern individuality. According to this hypothesis, the loss of distance in the pseudo-synchronous broadcasting of performance accounts for the decline of individuality in mass society (Ong, 1971, pp 284-303; Katz, 1980, pp 84-89).

McLuhan (1964, pp 50-51) was not afraid of the political consequence of this thesis, essentially the demise of Western individualism. He predicted the rise of a new form of collectivism based on the replacement of 'literate, fragmented Western man' by 'a complex and depth-structured person emotionally aware of his total interdependence with the rest of human society.' But what if the dominant medium of the next century is not structured like broadcast television but like CMC? Such an environment, based on generalised retrievability, suggests a different future in which a new form of 'post-modern' individualism emerges, not as a retrograde reminder of the dying past, but in response to the most advanced methods of mediating experience (Lyotard, 1979, pp 103-104).

Absorption

Computer conferencing is frequently said to build community, but the idea of community implies bonds of sentiment that are not always necessary to effective on-line communication. A group of interested individuals may produce a
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successful conference whether they form a community or just a temporary gathering. Rather than focusing on the concept of community, it would make sense to study the dynamics of conferencing on its own terms. This may open a way to understanding the sociology of the conference group, its specific 'sociability'.

Conferencing dynamics involve the management of time, both the personal time of the participants and the overall time of the conference. Sometimes these dynamics are determined by extrinsic factors, such as job deadlines or the urgent need to accomplish a mission. Conferences are surprisingly fragile, however, and no amount of external time pressure saves hopelessly mismanaged on-line groups. To a lesser extent, we see something similar in face-to-face meetings, which require not only an extrinsic raison d'etre but also skillful leadership to insure a hearing for all those with something to say.

The social cohesion of conferences therefore depends not only upon the extrinsic motives participants bring from their off-line lives, but also the intrinsic motives that emerge in the course of the on-line interaction. To understand these intrinsic motives, we must discover how the conference empowers its members to speak up and provokes others to reply.

The sociability of conferencing resembles that of sports or games where we are drawn along by interest in the next step in the action. Every comment has a double goal: to communicate something and to evoke the (passive or active) participation of interlocutors. We can say that playing at computer conferencing consists in making moves that keep others playing. The goal is to prolong the game and to avoid making the last move. This is why computer conferencing favours open-ended comments which invite a response, as opposed to closed and complete pronouncements.

Erving Goffman introduced the term 'absorption' or 'engrossment' to describe the force that draws us into an encounter such as a game (Goffman, 1961). The concept of absorption refers to the sharing of purpose among people who do not form a community but have accepted a common work or play as the context for an intense, temporary relationship. The term nicely describes participants' feelings about an exciting conference. They are 'absorbed' in the activity as one might be in a game of poker or bridge.

To the extent that social organisation is increasingly projected onto the electronic world of CMC, this peculiar agonistic structure of on-line human relations will tend to be generalised as well. Those observers of contemporary society who see movement away from institutional and sentimental stability toward more fluid, temporary 'contracts' will find here a confirmation of their thesis. CMC is a privileged technological scene where we may observe the 'atomisation of society into flexible networks of language games' (Lyotard, 1979, p 34).

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GROUPWARE

Social Network Design

If computer conferences resemble games, then how are they organised, by whom, and on what sort of 'field' of play? These are practical questions, to be sure, but more is needed than a simple list of 'do's and dont's'; a theory of mediation must inform our approach.

It would be a mistake to treat this as essentially a technical issue. Although technology is important for any mediated activity, it cannot 'automate' what is in reality a social encounter based on specific social practices. These social practices are unusually complex because of the difficulty of mediating organised group activity in a written environment. Failures and breakdowns occur at the social level far more often than at the strictly technical level.

Until recently, it was possible to ignore rejection of the on-line experience because the disappointed users of CMC entered and left the system on a one-by-one basis as subscribers to information utilities or synchronous dialogue programs. Today, however, individuals often enter the CMC environment collectively, along with co-workers or fellow students in highly structured groups. Dissatisfaction in this context visibly affects group performance and must be addressed. A new profession - the social network designer - has emerged to solve the problems of organising and leading on-line groups. The success or failure of on-line groups depends initially on decisions such as:
- the selection of systems, training techniques and materials adjusted to the proficiency of the group.
- the selection of software and systems with the features best adapted to the needs of the group.
- the construction of conference architecture by breaking down the various concerns of the group into separate discussion forums.
- the provision of leadership, and development of moderating skills amongst members.

- the starting of conferencing activities with all the members of the group clear on the agenda and procedures.

Organising groups in the 'written world' demands an unusual insight into group processes as well as an awareness of the technical features of communications systems. The social network designer needs both these skills in order to build specific software structures out of available programs and features. Such structures are called 'groupware' by Peter and Trudy Johnson-Lenz:

"Groupware = intentional GROUP processes and procedures to achieve specific purposes + softWARE tools designed to support and facilitate the group's work." (Johnson-Lenz, 1982).

The term 'groupware' refers to the combination of group process and software that characterises a network as a communications system.

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Understanding Social Factors

Computer conferences create electronic social environments every bit as complex as the buildings serving the social activities that go on in face-to-face encounters. There is no generic answer to the question of where to put the walls, doors and corridors of a building. Architects and interior designers must devise solutions corresponding to the anticipated needs of the users. So too, designers of CMC systems must anticipate the requirements of the users of their products. The software's social architecture determines the success of group communication just as the location of chairs, tables, blackboards, podiums, affects more traditional forms of human interaction.

'Human factors' research tries to identify inherent constraints on product design with regard to human nature. By analogy, research into 'social factors' seeks to identify constraints on the design of products for this or that social group or category. These social considerations are generally known to well-informed product designers, marketing executives, and on-line group leaders but there is no one field where social factors are studied systematically. As a result, they are more likely to be misunderstood or overlooked than human factors.

This is a matter of great consequence for computer-mediated communications. Despite their complexity and variety, conferencing systems are not yet designed as social environments. Designers and users still tend to view CMC as merely one more communications technology, competing with the telephone and mail or available as a convenient travel substitute. From this standpoint, the .social network designer resembles the designer of a device such as a telephone, who must adapt the equipment to human hearing, dexterity, etc. The search for generic solutions to the problems of the typical 'human' user obscures the fact that groups are realities in their own right, with socially specific needs that must be served by CMC technology. Often rationalistic assumptions blind designers to the specificity of group needs. They believe that they can understand and organise communication 'logically', on a priori grounds, rather than sociologically, in terms of the realities of actual social experience (Winograd and Flores, 1986).

Typically, products designed as generic solutions are offered to users in much the same way a new phone system or FAX machine would be. System administrators try to get people on-line with the hope that once they connect something will happen. This

approach to CMC leads to disappointing results. It ignores the most profound potential of the medium, which is to provide electronically for groups to achieve a common purpose.

Tailored Conferencing Systems

The value of software features is relative to group needs and so varies widely. For certain groups, the addition of a specific feature may have little importance, while for other groups that feature can turn out to be vital (Vallee, 1984).

Educational conferencing systems, for example, are fairly limited in their ability to handle mathematical symbols. Not surprisingly, then, educational
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conferences are almost entirely to be found on the non-mathematical side of the campus. Here one might conclude that conferencing is best suited to qualitative discussion, but this conclusion would be premature if the systems simply cannot transmit graphics and mathematical symbols (Hiltz, 1986).

Does this mean that the best system is the one that offers the most features? The most complex and powerful conferencing systems do in fact offer ways of meeting multiple needs, but their sophisticated commands are too difficult for many users. Powerful systems, frequently trade off ease of learning for additional flexibility (Goodwin, 1987). Unfortunately there is no correlation between the level of proficiency of on-line groups and the specificity of their on-line needs. In fact, most users need both an extremely simple interface and one that tackles specific tasks. For such users, the far-ranging power of an adaptable system is likely to be experienced as a weakness, a fatal design defect.

To be effective for many purposes, CMC products must employ simple, group-specific interfaces for unskilled users. I believe that the best way of accomplishing this would be the creation of tailored systems based on a powerful, mutable program. This program must incorporate software tools that respond to both standard and specialised needs. Each tailored version of the basic program must share a common list of constant features and differ from others only in the variables it offers.

For most purposes a simple interface should be designed that will direct users toward the features they are likely to need. These features are 'foregrounded' by being placed in routinely visible menus while the others remain accessible in the background. The size of the foreground in each case will be determined by the competence and experience of the group.

The task of creating these tailored interfaces appears daunting. The variety of groups and tasks is so immense that it is difficult to imagine suiting them all. And yet the fact is that in many design fields this vast diversity is simplified with great success. For example, interior designers manage to accommodate all sorts of groups with just a few arrangements of walls, windows, corridors and doors. Something similar is possible in the field of CMC. The task is to map the variety of social situations into a limited number of communication environments. Many different groups and activities will turn out to require identical designs. The difficulty, while real, is manageable.

The concept of communication requirements stands as a link between the sociology of group behaviour and the technical capability of CMC. Communication requirements are group needs which can be addressed by the appropriate configuration

of communication systems. Thus an instant 'message waiting' signal might be needed by certain groups, or secure communications, graphs and charts, or form filling capabilities by other types of groups. Figure 2.1 sketches a preliminary classification of such communication requirements.

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PRODUCTION

Access -	Private and group messages/private and public conferences/bulletin boards
Group Process -	Action support/contextualisations/moderating/ interaction rate (synchronous/asynchronous)
Relevance -	Conference architecture/overload protection/length of contributions

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RETRIEVAL

Time -	Alarms/reminders
Reference -	Indices/keywords/title displays/ conference architecture/ search programs/hypertext
Sharing -	Data/programs/lists/documents

PRAGMATICS

Friendliness -	Syntax/learning/help/error control
Identity -	Public (real names)/private (anonymous, pen names)/subscriber information (directories)
Safety -	Security/secrecy/reliability
Inputs -	Mathematics/texts/graphics

MANAGEMENT

Accounts -	Opening/grouping/billing/enrolling in conferences/updating
Tailoring -	Help files/command prompts/opening screens/system architecture

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Figure 2.1 - Communication Requirements

Selecting Conference Architectures

Ideally, conference architecture should be constructed according to the social characteristics of different groups. Today this is possible only to a limited extent. Each CMC program strives for an unattainable social neutrality and, in falling short, favours one group more than others. The network designer needs to be aware of these differences between programs, and must be able to take advantage of their strengths.

Conference architecture classifies incoming and archived messages and distributes tasks among groups or individual conferences. Here the metaphoric identification of conference architecture with interior design is most clearly

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relevant since each conference on the network is a bit like a room in a building. Network design and interior design both pose the same question; "Who needs to communicate with whom about what?" Then, equipped with the answer, it asks, "How many conference 'rooms' of what 'size' are required for the tasks of the group?" We must make our choices carefully: while it is less difficult to change conference architecture than the interior of a building, it can be confusing for a group to find the structure of its message system altered in mid-stream.

The implied sociology of conferencing software differs widely. Most designs today are either group-centred or topic-centred. A group-centred system promotes the cohesion of stable groups around a common discussion, the topic of which may evolve and change with time. Topic-centred systems, on the other hand, organise shifting groups of participants around the topics under discussion, occasionally forcing members to branch off to new conferences to discuss new issues. These different software structures reflect contrasting views about how best to file or classify on-line texts: in terms of a group process from which the text emanates and to which it contributes, or by subject which, presumably, will determine interest in the text whatever its source.

The Electronic Information Exchange System (EIES;) and Participate; represent two extreme cases, with other systems such as CONFER; and VaxNotes; offering a compromise based on item/reply branching. These latter systems are interesting for what they reveal about the problem of social network design. Each text designated by the author as an 'item' can become the starting point for a sequence of 'replies' addressed to the topic it raises. In practice, this means that after reading each new item, the user is prompted to choose to respond to it or to introduce a new topic.

This software feature can be used for two very different communicative functions, which I call 'contextualising' and 'classifying'. In the first case, each new item serves as a context for the replies it engenders. The most appropriate replies are brief texts quickly offering recognition or asking questions. As soon as users pass on to new items they cease to reply to old ones, even if the subject discussed in the old item is broached again. This application of the item/reply structure resembles a group-centred system. In the second case, where the item/reply structure is used to classify subjects of discussion, each participant uses the structure to maintain a logical organisation by topic, as in a branching, topic-centred system.

Technically, the two applications are identical, but socially they are very different. The correct choice in terms of group competences and needs may make the difference between success and failure. The social network designer should therefore select a

configuration that fits the conversational style of the group. A large group of specialists collaborating on many complex projects might find branching essential to managing large masses of information. On the other hand, a group which values the process of discussion in itself might prefer a group-centred format for its activities.
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The Moderator

Like other small groups, computer conferences are most successful when skillfully led. The technical conditions for this are usually defined in the conference program as a 'moderating function', ie setting up groups of participants as 'conference members', establishing and naming a file in the central computer in which to store discussions, and occasional deletion of irrelevant messages from the file.

These technical powers represent, however, only a small part of the moderating groupware, which Hiltz and Turoff (1981, pp 23-24) describe as follows: <>blockquote> In order for a computerized conference to be successful the moderator has to work very hard at both the 'social host' and the 'meeting chairperson' roles. As social host she/he has to issue warm invitations to people; send encouraging private messages to people complimenting them or at least commenting on their entries, or suggesting what they may be uniquely qualified to contribute. As meeting chairperson, she/he must prepare an enticing-sounding initial agenda; frequently summarize or clarify what has been going on; try to express the emerging consensus or call for a formal vote; sense and announce when it is time to move on to a new topic. Without this kind of active moderator role, a conference is not apt to get off the ground.

The moderator's role can also be considered as a literary equivalent of the 'intermediary' described by Luce Giard and Michel de Certeau (1983, p 11) in their discussion of neighbourhood life. But this is an intermediary active in new electronic 'localities'. In these new spaces there is a need for someone to serve as a "translator who decodes and recodes fragments of knowledge, links them together, transforms them by generalisation, handles each conjuncture of events by comparison with a previous experience and puts together in their own way, by an everyday practice, a logic of the general and the practical, of action and of time."

It is strange to contemplate communication without a tacit dimension. Strong leadership must compensate for the missing cues. What I call 'contextualising' and 'monitoring' functions are explicit substitutes for the tacit signals that guide talk in everyday settings. These two functions complement each other. In contextualising, the moderator establishes a general arena of topicality, speaking in the name of the group. Monitoring offers verification of the accuracy of each participant's judgements about the nature of the communication context so defined.

The moderator's most basic task is to choose at the outset a 'communication model' for the group. Human relationships (the 'pragmatics' of communication) differ for example, in meetings, courses, informal conversations, parties, doctor's visits, and so on. As soon as we enter a room, we orient ourselves according to the tacit cues of the conversation we are about to join. These contextual cues establish a mood from which flow norms, roles and expectations. In the absence of visible cues, on-line moderators must make an explicit choice
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for the group they lead, reducing the strangeness of the medium by selecting a familiar system of roles and rules derived from everyday life.

Contextualising has the unusual semiological property of proceeding largely through the use of 'performative utterances'. These are statements which bring about the very reality they describe. An example would be the Principal's statement to the assembled scholars to the effect that "School is now open for the new term." Such an utterance effectively 'opens' the school and so is called 'performative'. Performatives appear frequently in the contextualisation processes of ordinary speech (Austin, 1962; Turner, 1970).

In most face-to-face interaction, performatives play a secondary role because so much tacit information is available to define the communication model. In computer conferences, on the other hand, performatives are usually the principle or only means of defining the communication model. Unless someone opens the conference by saying "This is a meeting", "This is a class" or "This is a support group" the participants have no way of being sure what kinds of contributions are relevant.

The moderator's contextualising functions relieve some of the anxiety participants experience in an electronic setting. Once a communication model has been chosen, the moderator must play the leadership role implied in that model, such as chairperson, host, teacher, facilitator, entertainer, and so on. This role will involve monitoring conformity with the communication model by reassuring participants that their contributions to the discussion really fit that model.

Meta-Communication and the Art of Weaving

Moderators also play an important role in initiating and sustaining meta-communication, ie communication about communication. Meta-communication is particularly valuable for strengthening a weak communication link by calling attention to problems in the process of discussion. Although, we occasionally engage in explicit meta-communication, as for example, when we ask our interlocutor to speak up or to come to the point, cues we give with our bodies and tone of voice are so effective that we can usually carry on complex conversations without employing much meta-talk. Not only can we get along without uttering our meta-messages, it is often embarrassing or disruptive to do so.

But in computer conferencing the only tacit sign we can transmit is our silence, a message that is both brutal and ambiguous. The solution to this dilemma is explicit meta-communication. Whenever communication problems arise, participants must overcome their inhibitions and demand further explanation of unclear remarks, call attention to information overload, request clarification of emotional tone and intent, suggest changes in the rules of the conference, and so on.

Meta-comments concerning the content of the discussion are called 'weaving' comments. These summarise the state of the discussion, identifying its unifying themes and points of disagreement. These comments reveal
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an important benefit of textual mediation for social interaction. Writing a weaving comment involves a relation to discourse which is characteristically literary and encourages a command of the written world 'from above'.

Many conferences lack weaving because no one has the time or the talent to perform the function for the group. This is unfortunate since, as a written medium, conferencing offers a unique opportunity to reflect upon the agenda of the group. The conference moderator or another participant can review printouts, harkening back to earlier discussions, clarifying confused expressions, identifying the themes, making connections, 'indexing' the material mentally.

Such weaving comments supply a unifying overview, interpreting the discussion by drawing its various strands together in a momentary synthesis that can serve as a starting point for the next round of debate. Weaving comments allow on-line groups to achieve a sense of accomplishment and direction. They supply the group with a code for framing its history and establish a common boundary between past, present and future.

Figure 2.2 provides a summary list of the moderating; functions discussed above (Feenberg, 1986; Kerr, 1986).

CONTEXTUALISING FUNCTIONS

Opening Discussion: Carefully designed opening comments should announce the theme of discussion, and identify any shared experiences or symbols which can clarify content and purpose

Setting Norms: A familiar communication model should be selected to establish tacit expectations about conference behaviour, and to suggest rules of behaviour

Setting Agenda: The moderator controls the order and flow of discussion topics, and generally shares part or all of the agenda with participants at the outset

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MONITORING FUNCTIONS

Recognition: The moderator refers explicitly to the participants to assure them that their contribution is valued and welcome, or to correct any misapprehensions about the context of discussion

Prompting: To solicit comments from participants, either publicly or through private mail messages; might be formalised as 'assignments' in some conferences

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META FUNCTIONS

Meta-commenting: To remedy problems in context, norms or agenda, clarity, irrelevance, and information overload

Weaving: To summarise the state of the discussion and to find unifying threads in participants' comments; it encourages these participants and implicitly prompts them to pursue their ideas

Figure 2.2 - Moderating Functions

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Recognising, prompting, weaving and meta-commenting are listed as moderating functions, but that is not because there is only room for one person to perform them. Rather it is to ensure that there be at least one person who accepts responsibility for keeping the group alive. Discussions are most absorbing and successful when the members of the group share these functions with the moderator.

THE FUTURE OF COMPUTER CONFERENCING

Integrated CMC

Computer conferencing is an example of what Gilbert Simondon (1958) calls progress through 'concretisation'. Technological advance often proceeds by the integration of apparently separate, externally related functions in a new and more 'concrete' whole. Conferencing can be considered as a concretisation of mail and filing technologies.

The mail system relies on orderly filing of received messages. Only a message that has been filed can be re-accessed later, not only by the recipient but also by his associates locally. While the means of transmission have advanced rapidly over the last century from the pony express to packet switching, filing technology has remained stable, requiring the recipient to open the letter and insert it into an appropriate folder. Even electronic mail; systems force individual senders and recipients to be responsible for the local disposition of messages.

With computer conferencing the central computer serves as a remote filing cabinet where all participants can see and respond to the latest additions to the discussion. No longer is it necessary for a local recipient to dispose of the message; instead, the sender can place it directly in a virtual locus which is shared by all participants. Computer conferencing 'concretises' the previously separate functions of transmission and archiving. The social structure of mail as a basically one-to-one means of transmission is scrapped and replaced by remote group interaction.

But this technological advance exacts a price: creating a purely electronic or 'virtual' meeting space results in a loss of context. Contextualisation is the weak link in computer conferences, far more so than in familiar communications systems. The absence of tacit cues and coded objects strands participants in a contextual void that may leave them literally speechless. The uncertainty of a poorly contextualised communication leads to defensive withdrawal.

Decontextualisation is an essential effect of writing as a medium. Familiar uses of writing, such as record keeping and literature, are based on the advantages of the abstract written word. Never before, however, has writing been used as the primary support of small group activity. When writing is adapted to this purpose, it becomes clear that it is not self-sufficient but needs to be supplemented by other means of expression.

CMC writing may be compared to vocalised communication in a face-to-face encounter: both media carry the semantic content of the exchange. But the sound

of voices alone is insufficient for effective communication, and, as we have seen, gestures and facial expressions are needed to provide additional cues. The bandwidth of writing is even narrower than that of voice. CMC thus suffers comparable limitations when it is confined strictly to the exchange of written text.

Given these limitations of CMC, the contextualisation of computer conferences must be carefully planned. Only a few elements are available as substitutes for all that is lost in the narrow band of electronic communication. The most effective contextualising brings the group together for a face-to-face discussion. At such a meeting, participants learn about network design, initiating friendly exchanges and practicing their technical skills. Meanwhile, the trainer develops personal contacts which will be helpful later, when offering reassurance and advice on line. The face-to-face meeting can also synchronise the commencement of the on-line exercise through a ritualised initiation to the conference. Where it is impossible to hold such a meeting, the mail and telephone calls may substitute for it.

The fact that contextualisation in CMC often requires a face-to-face meeting is an admission of defeat. Computer conferencing still depends on face-to-face contact. Clearly, with the present technology, conferencing is not fully autonomous, but is only a fragment of a more developed CMC medium to come. In the future, programs will generate a rich and varied environment where electronic group activity will be significantly enhanced. The new CMC medium will take advantage of the computer's capabilities by integrating media such as hypertext, videotex, film, and audio recording.

This perspective on CMC's future finds support in the history of other technologies. The cinema as we know it is the product of the seamless merging of photographic and recording technologies. The automobile fuses a half dozen distinct technologies. Something similar is happening today with CMC. But it requires imagination as well as technical experience to see into CMC's future.

The Client/Server Model

Conferencing systems still rely on a traditional timesharing model of networking in which users access an intelligent host with a dumb terminal. These designs persist even today, when more and more users have abandoned dumb terminals for microcomputers capable of taking the first step in the direction of integrated CMC.

This step introduces the 'client/server' model of networking in which small computers, are linked to large ones. In such a distributed system, many problems of social network design will be palliated by creating a richer, more complex, yet manageable, environment.

In future conferencing systems, a transparent client/server model will replace the current, clumsy process of connecting and disconnecting two separate computers. These systems will offer a common interface so that users will hardly be aware of whether they are working on the terminal or the host. They will be offered sophisticated communications and word processing software which will
make it easy to sign on and download, by automating all or part of the relevant commands. These facilities can be complemented with an efficient script language in which to write 'macro' commands combining sequences in the host system command

language. Network designers can even download programs and directories periodically to groups of users at remote locations, re-tailoring their communications software as the conferencing schedule advances.

In the client/server model, the user's own terminal can become a source of contextualising information that would otherwise be lacking or which would have to be supplied at a costly face-to-face meeting. If all conference participants are supplied with program disks or videodisks containing such things as a database, an image bank or an educational program, then they share not only common access to an on-line conference, but also information delivered in a sophisticated form which can provide a richer background for their discussions. Similarly, if the conference archive is indexed and reconstructed using hypertext programs, then the group's own past becomes readily available to it as a context for its future. The early experiments with these systems are most likely to occur in the field of distance learning, which has been at the leading edge in CMC ever since the introduction of this technology. [4] [5]

Conferencing already offers the possibility of accelerated exchange between teacher and student. In the electronic classroom, students can interact and watch each other interact with the teacher. The next step may see computer-assisted instructional diskettes or videodisks designed to be accessed from within a computer conferencing program. The teacher could assign work on portions of the disks and carry on discussions with the students on-line, responding to their questions and providing motivation. Here many of the advantages of CAI could be combined with the traditional benefits of classroom teaching.

CONCLUSION

The elements described in this chapter constitute an ensemble of practices for successful computer conferencing. Let us recall some of the principles on which these practices are based:

- Computer conferencing is a technology which, for the first time, allows small groups to form and communicate through inexpensive and technically simple electronic mediation.
- Many types of conferencing environments exist, depending on the sociology of the interacting group. For example, conferences may be based on a subject (of teaching or research), on a project (management, negotiation), or on the communication needs of the group itself (information exchange, mutual support), and so on.
- In the written world of textual mediation, many of the ordinary conventions and rituals of small group communications are lost. Their reconstruction involves passing from 'natural' communication to an 'artificial', consciously designed pragmatic.
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- This new type of communication must be organised and sustained by designers and moderators.

Finally, we must remember that CMC is a technology in process. Designers and users should involve themselves in the invention of the systems they require rather than passively accepting what they are offered as a final product.

NOTES

[1] I would like to thank Matthew Robbins for his help in preparing this chapter.

[2] The erotic charge of new communications technology in France today curiously parallels early experience with the telephone in that country. See Catherine Bertho (1981, pp 243-245).

[3] Derrida's (1972b, p 392) discussion of the concept of iterability, reminds us of the relativity of the distinction between speech and writing, and shows that speech is no more original than writing. Thus we can agree with his remark on McLuhan, to the effect that "we are not witnessing an end to writing which would restore transparency or immediacy to social relations according to McLuhan's ideological representation." Yet, a non-ideological reconstruction of the distinction generally covered by the difference between speech and writing is needed. This is what I attempt in the remainder of this section.

[4] The first course taught using computer conferencing seems to have been a writing course offered by David Hughes for Colorado Technical College in 1981. In 1982 The Western Behavioral Sciences Institute (WBSI) became the first institution to employ computer conferencing as the primary vehicle for the delivery of an educational program. The WBSI program is described in Rowan (1986, pp 71-74).

[5] See chapter 7 for a description of a prototype for a distance learner workstation combining CMC with CAL, hypertext, and other media.(ed)

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This book constitutes the refereed proceedings of the 31st Conference on Current Trends in Theory and Practice of Computer Science, SOFSEM 2005, held in Liptovský Ján, Slovakia in January 2005. The 28 revised full papers and 16 revised short papers presented together with 8 invited contributions were carefully reviewed and selected from 144 submissions. The papers were organized in four topical tracks on foundations of computer science, modeling and searching data in the web area, software engineering, and graph drawing and discrete computational mathematics.