PLANET: A computer conferencing system and its evaluation through a case study

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Computer conferencing is a medium of communication which allows conferees to remain at their home locations and make entries at their convenience through typewriter computer terminals. All entries are stored in a central computer in the form of a continuous conference transcript. Upon entering, an individual can determine who has made entries since he or she was last in the conference and can examine all or selected entries. A participant is also notified if any of the other conferees are present. The entire transcript is accessible at all times and can be automatically reviewed by the participants. The computer conferencing system used for this conference (Planet) was developed by the Institute for the Future in Menlo Park, California, and is designed for persons with no previous computer experience. Accordingly, the entire conference is conducted in normal English without special computer language or commands. Essentially, the participant has three options for making an entry into the conference. First, the conferee can make a public entry that will be available to all other conferees. This entry is numbered and dated, and the author is identified. Second, the conferee can send a private message to another conferee that will only be seen by the recipient. Third, the conferee can enter an anonymous message that is numbered and dated with no author identification. A number of other services are available, including an index that instantly displays previous discussions, using key words, searches, and the like, and a technique for determining the status of participation for all other conferees.

Computer conferencing has several advantages: (1) It allows the participant to remain at home and to participate in a leisurely and convenient fashion; (2) it requires specificity in that all entries in the conversation must be typed, not spoken; (3) it is not timebound, since the computers are available 24 h/day; and, (4) it permits accessing of complex data which is not always possible in face-to-face conferences. The chief disadvantage is that the medium itself is relatively expressionless. Consequently, nuances might be lost during the discussion; it is very difficult to wink through a typewriter terminal.

A broad evaluation of computer conferencing is available through the Institute for the Future in a publication entitled, "Group Communication Through Computers," by Jacques Vallee and others (1975). This

presentation will concentrate on a more personal evaluation of a specific conference in order to provide a flavor of how the Planet system works.

Recently, the Lilly Endowment and the Institute for the Future cosponsored a computer conference on an integrated data base in postsecondary education to accomplish two tasks: First, the substance of the conference was of interest, and it promised no easy answers. Specifically, we wished to explore the problems and advantages associated with the possibility of establishing a comprehensive and comparable data base for postsecondary education in the United States. Second, we wished to conduct an experiment that would permit evaluation of computer conferencing as a communications technique among likeminded people engaged in sorting out the myriad problems confronting postsecondary education today.

Twenty people currently engaged in a wide variety of research projects on higher education were invited to the conference. The invitation list was neither exhaustive nor representative, but we did endeavor to select a group of people that would reflect as diverse a set of perspectives as possible; 10 states and England were represented. A variety of academic disciplines, policy analysts, computer scientists, administrators, faculty, and other researchers were represented. The common denominator was an interest in the problem at hand coupled with a reasonable degree of familiarity with the issues to be discussed. A brief instruction period was conducted by the staff of the Institute for the Future.

Substantively, the conference was a success. This paper deals with some observations of the conference as a technique for communications. The first and most obvious question deals with the extent to which the participants actually participated. Figure 1 shows the number of messages sent in the system by the day of the conference in which they were sent. It is obvious that: (1) There were many more private messages sent than public messages; (2) the total number of messages, both public and private, continued to rise at a relatively proportional rate from the beginning of the conference to the end; and, (3) there was a slight lag in public messages in the middle of the conference, but this was accounted for by the fact that several participants were precluded from activity at that time. The total number of messages (261 private messages and 192 public

Figure 1. Number of private vs public messages during the course of the conference.

messages) can be misleading since, of course, a message can be very short or very long.

Figure 2 further analyzes the messages by the number of total characters sent. A quick calculation would show, for example, that the average public message contained approximately 550 characters. (This figure indicates the percentage of total characters sent by the various participants during the conference.) Most of the characters were sent by roughly half of the participants, but no one participant clearly dominated the discussion.

Figure 3 shows essentially the same information, but groups the participants according to the institution represented. The vast majority of institutions participated in the conference quite strongly and on relatively equal terms. The largest percentage of public messages represented only 17% of the discussion, while the eighth-ranked institution contributed approximately 6%. This offers further evidence in support of the hypothesis that participation was fairly evenly distributed throughout the conference.

A second question relates to the time of day in which the conferees participated. An analysis of the monitor statistics (see Figure 4) yielded interesting data. First, 36% of the messages were sent after the normal work-day hours of 9:00 to 5:00. This indicated that a substantial number of the participants either remained in their offices to join the conference, or took the portable terminal home and worked late at night. The heaviest single hour of participation was from 3:00 to 4:00 in the afternoon, local time, in which 21% of the public messages were sent. One can only conclude that the small amount of participation in the morning hours is indicative of the desire on the part of the participants to engage in interactive discussion with their colleagues. Thus, the people on the east coast tended to wait until afternoon to insure

that west coast people would be up and around. (Parenthetically, at least one participant was travelling that week, and he was able to use his terminal in airports, hotels, and other locations.)

In addition to the monitor statistics, we sent out a questionnaire in order to determine the participants' personal feelings with respect to the conference. The following facts were gleaned from an analysis of the questionnaires: (1) Most of the participants noted that they were sometimes frustrated with the conference, but the vast majority indicated that they were seldom confused or bored. (2) Although participants felt able to express their views completely, many indicated that they also felt overloaded with information. (3) Most participants felt that the conference tended to encourage both imagination and creative thinking. (4) Although

Figure 2. Percentage of total characters sent by various participants during the conference.

Figure 3. Percentage of total characters sent by participants according to institutions represented.

Figure 4. Number of messages sent by conferees during different times of the day.

the conference encouraged cooperation, participants also felt that it had little effect on consensus. (5) Most participants felt that the conference provided the opportunity for information exchange in the generation of new ideas, development of alternatives, the identification of important areas of discussion and in specific information. (6) Most frequently mentioned was the fact that the conference provided a complete record of proceedings which facilitated the use of handily available references and allowed for detailed review during the proceedings. (7) Most felt that the conference started new communication patterns among participants which led to new contacts and new ideas, and that this was probably a result of the diversity of the group. (8) Most participants felt that there was too little direct interaction among participants; that is to say, not enough synchronous conferencing, and not enough direct interchange.

Correlating the results of the questionnaire with the monitor statistics, three facts seem to stand above all others: (1) Much of the discontent with the conference was with the subject matter and not with the conference logistics; (2) where participation was the highest, there was a corresponding low degree of frustration and

discontent; and, (3) participants with the highest number of private messages were least likely to claim that there was little personal contact, and they were least likely to state that cooperation and consensus was inhibited by the conference.

The costs of the conference are quite interesting, especially when compared to the costs of a face-to-face conference. As mentioned earlier, the computer conference was asynchronously conducted over 5 days, and the participants stayed at home. Basic costs were: \$1,500 for computer time, which included both the introductory sessions and the actual conference; \$500 in labor costs for organization and the introductory sessions; and \$150 in telephone costs for initial invitation and the introductory sessions. Total cost was \$2,150. By comparison, a face-to-face conference held in a synchronous fashion for 1 day, in which the participants would be expected to travel to Indianapolis, would have the following array of costs: travel for 17 persons, round trip to Indianapolis, \$3,596; meals and lodging at \$40 per day, \$650; labor costs for organization, \$300; cost for taping and transcribing, \$500; for a grand total of \$5,076. Omitted from the computer conference are such costs as computer rentals, since

most of the participants either had their own computer terminals, or had one readily available which could be borrowed. From the face-to-face conference were deleted the costs of renting conference facilities. From both conferences, the actual labor costs of the participants during the conference have been omitted. Nevertheless, the difference in total cost is quite striking in that the computer conference held over a 5-day period appears to be almost \$3,000 cheaper than a face-to-face conference held for 1 day.

Shortly after the computer conference was completed, the Lilly Endowment held another conference on an entirely different issue in which participants from around the country were invited to come to Indianapolis and spend the day discussing several issues. We thought it might be interesting to send to them the same questionnaire, with appropriate modifications, that was sent to the participants in the computer conference, and to compare the results of the questionnaires. The questionnaire was divided into two parts: The first concerned an open-ended invitation to discuss the ways in which the conference was successful and unsuccessful. The second part dealt with a series of limited questions to determine the extent of frustration, confusion, boredom, amusement, distraction, and the extent to which the conference encouraged imagination, creative thinking, cooperation, consensus, and the like. In the latter section, with the exception of confusion, there were no significant differences between the respondents of the computer conference and the respondents of the face-to-face conference. With regard to confusion, the participants in the computer conference noted slightly more confusion than those in the face-to-face conference. Of course, one would expect this result since the computer conference was an entirely new experience for the participants.

An entirely different picture was presented in the open-ended evaluations. As one would expect, a substantial number of comments on the success of the computer conference related to the fact that the conference took place in addition to normal work activities, without travel, in and out of office hours, and the like, and it was an inexpensive, enjoyable, unique experience. None of these comments appeared on the part of the participants in the face-to-face conference. The main emphasis in the face-to-face conference, instead, was placed on the fact that the conference started new communication patterns among participants. While this was also mentioned by a majority of the computer conference participants, more than 60% of them added that the conference provided the opportunity for information exchange. Conversely,

only about one-third of the face-to-face participants mentioned this as a peculiar success of the conference. In response to the question of the ways in which the conference was especially unsuccessful, roughly one-half of the participants in the computer conference mentioned that there was too little interaction and not enough focus to the discussion. Participants in the face-to-face conference presented a very different picture. Three-quarters of them complained of too little direct interaction among participants and fully 60% had negative reactions to specific speakers and felt that an available record of the proceedings would have made a big difference in their understanding of the discussion. In summary, the parallels between the two conferences are rather remarkable; in fact, there seems to be little difference in the comments made on the part of the various participants. What is striking is the fact that the participants in the face-to-face conference would have liked more direct interaction, more of a record of the proceedings, and more of an opportunity for information exchange, all of which were more readily available in the computer conference.

We began this experiment hoping ultimately to term it a "success" or a "failure." Along the way, we discovered that: (1) A computer conference, whether structured or informal, can be an effective tool for sharing ideas with colleagues independent of time and space; (2) longer conferences with more training time, at least initially, would diminish apprehensions about technical capabilities and would promote more leisurely analysis, since the discussion can become quite complex; (3) more levels of participation, in synchronous subgroups and the like, would help to keep the central discussion in focus, since subgroups can explore extraneous dimensions of a problem, reporting to the whole group periodically, and thereby reducing "interruptions"; and, (4) the computer conference can be extremely precise in information exchange, since it allows one to enter data accessed remotely in a timely fashion.

No doubt, technological advances will greatly alter this picture over the next few years, though one doubts that computer conferencing will fully replace face-to-face conferences. Nevertheless, a start has been made, and we think that it is a good one.

The evidence is overwhelming that, as participants become comfortable with the medium, their discontent diminishes remarkably. This, coupled with the fact that each participant in the computer conference has stated that he or she would like to be included in future conferences, leads us to believe that future efforts will be even more successful. It is on that conclusion that we term the experiment a "success."