Shaw, M. L. G. and Gaines, B. R. (1991). Supporting personal networking through computer networking. In Proceedings of CHI'91: Human Factors in Computing Systems, pp. 437-438. ACM Publications, New York.

SUPPORTING PERSONAL NETWORKING THROUGH COMPUTER NETWORKING

Mildred L G Shaw & Brian R Gaines
Knowledge Science Institute

University of Calgary
Calgary, Alberta, Canada T2N 1N4
mildred@cpsc.ucalgary.ca, gaines@cpsc.ucalgary.ca

REPGRID-NET: A NETWORKING SUPPORT SYSTEM

RepGrid-Net is a computer-based message system that integrates conventional electronic mail and bulletin board facilities with repertory grid elicitation and analysis facilities to provide both unstructured and structured communications supporting the formation and operation of special interest networks. Users see a mail system in which special-interest networks are specifically supported. The coordinators of such a network provide a basic focus for it through statements of intent, topics and issues which are handled on a bulletin board basis. They also provide one or more kernel grids listing specific topics and the concepts which they apply to them. These kernel grids can be developed by others interested in the groups, using the stated topics and concepts, and adding to them. General similarities between grids are analyzed to provide a socionet of people with common viewpoints, and this may be used to access the mail system to communicate with them. Detailed comparisons of similarities and differences between viewpoints may be made, and individual concept structures can be analyzed.

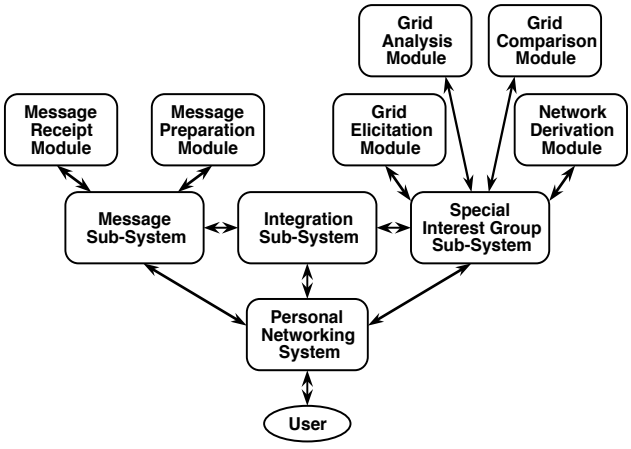

Fig.1 System architecture

The system is implemented on a network of Macintosh computers coordinated through AppleTalk access to an AppleServe file server. Figure 1 shows the overall systems architecture. The message sub-system is written in HyperCard and is conventional in its operation.

SYSTEM OPERATION

Figure 2 shows a special interest group coordinator eliciting a grid concerned with topics at a conference on artificial intelligence. Conference topics, session names and the papers within related sessions all provide a good basis for kernel grids. The interface shown is the same as that used for further elicitation by others. Initial concepts are also chosen by the coordinator and used to focus the group activities. However, the discussion is open-ended since further topics and concepts may be added freely by others, and the analysis takes these into account.

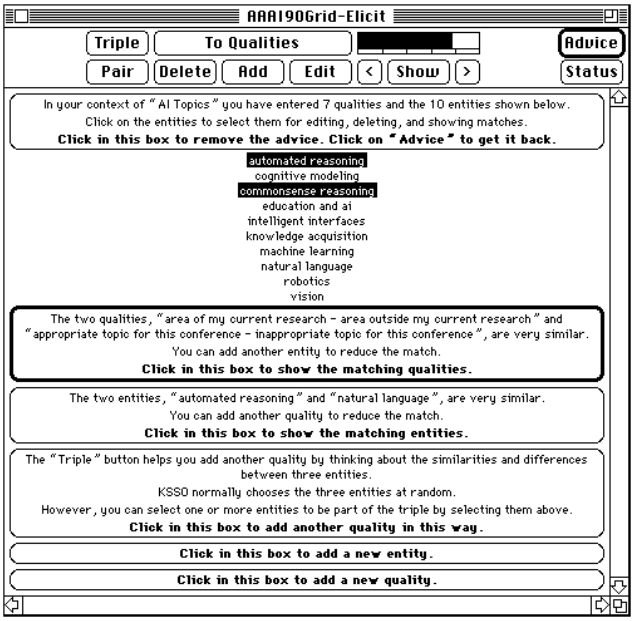

Fig.2 Topics for a kernel grid

The interaction is highly non-modal and mediated through the standard buttons at the top. To support new users the large advice 'buttons' at the bottom of each screen are generated dynamically. Data entered is continuously analyzed to generate this advice. Figure 3 shows a set of topics being rated along a concept dimension by dragging them to a rating bar. All of the RepGrid-Net interaction is through click-and-drag graphics as much as possible.

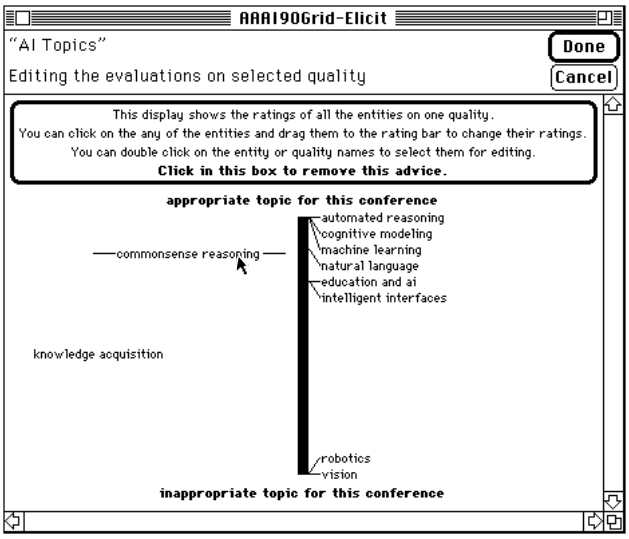

Fig.3 Rating topics along a concept dimension

Graphical analyses of the data are continuously available, and Figure 4 shows a two-dimensional cluster analysis of the topics and concepts for the coordinator. His or her interests and views show up clearly and this type of individual analysis is useful in its own right. Others participating in the special interest group activities can take one of the coordinator's kernel without his or her ratings, and make their own assessments of the topics on the concept dimensions, adding topics and concepts as they wish. They use the same graphic user interface and can analyze their own grids freely as they proceed—the cluster analysis takes only one or two seconds and is an effective 'payback' for the effort of the data entry.

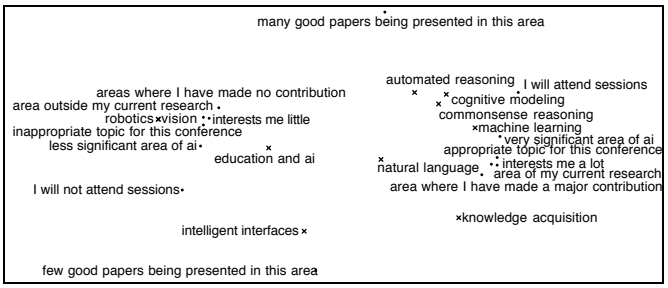

Fig.4 A cluster analysis of the resultant grid

GROUP ANALYSIS AND COMPARISON

Socio is a program in RepGrid-Net that analyzes pairs of grids to determine similar views on topics and similar use of concepts. As shown in Figure 5, it enables a socionet to be generated for set of grids on the same topic with the links showing the capability for understanding. This network analysis is continuously available for all the special interest groups. Someone can join a group by having a grid elicited as previously described and then looking at the network analysis to see where their viewpoint fits in relative to the others. The graph produced is interactive. Clicking and shift-clicking on nodes selects them and a popup menu then offers a variety of alternative actions, such as seeing a detailed comparison of the grids, analyzing them individually, or entering the message subsystem to send a message to those selected.

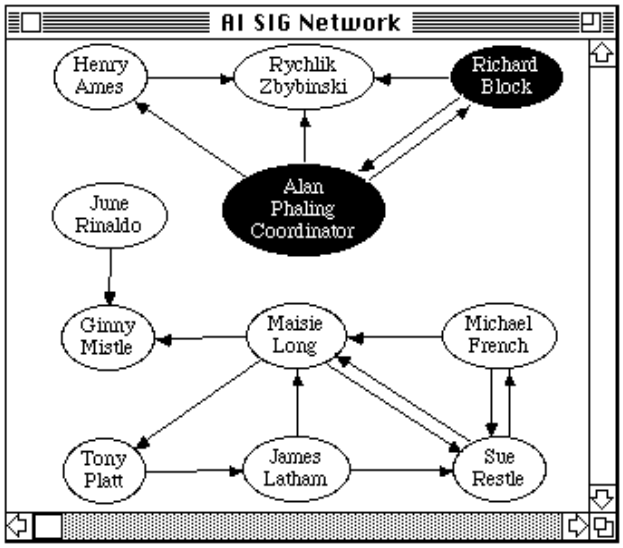

Fig.5 Socionet derived from individual grids in which the arrow shows the capability for understanding

Figure 6 shows a detailed comparison of two grids in which both the topics and concepts have been sorted from high agreement to high disagreement. This can form the basis of an interesting discussion.

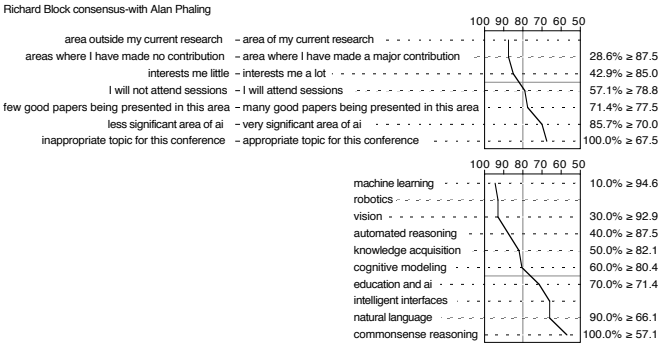

Fig.6 Detailed comparison of selected grids

It is very simple for users to move between the mailer and the special interest group sub-systems. A newcomer can log in, find out what special interest groups exist, browse through them looking at the networks, the grids, or their analyses. He or she can elicit a grid to participate in any special interest group, analyze it, compare it with the others, and see where it fits in the network. At any time during this process the user can send messages to other participants or to the bulletin boards associated with the special interest groups. The user can escape just as easily, leaving a grid in a partially completed state and come back later to complete it. The overall system is highly non-modal and intended to support, not pressurize users.