or her to identify bugs either in the way in which the agents are organised, or in the manner in which coordination proceeds within the organisation.

It should be noted that no single agent necessarily possesses a full picture of the organisational structure. It is the responsibility of the society tool to integrate local information returned by the agents into a global picture of the organisation.

Messages between agents can be colour-coded (for easy visualisation) by type, e.g. all request messages in one colour, or by content, e.g. all messages pertaining to a particular job in one colour. In addition, the tool supports the filtering of messages before display. Messages may be filtered by sender, receiver, type or content. For example, a filter option might state "show only counter-propose messages [type filter] from the set of agents ... [sender filter] to the set of agents ...[recipient filter] about job ... [content filter]". These features facilitate debugging by allowing the user to focus-in on the particular messages of interest. Further, combined with the off-line replay facilities with forward and backward video modes (discussed next), they provide a powerful debugging tool.

As mentioned earlier, the society tool also provides facilities for the storage in a database for later playback of the messages sent and received by the agents. Again, message filters can be used during storage and/or replay to select particular messages of interest. Replay facilities support the video metaphor, allowing a user to review the messages in forward or reverse mode, in single step fashion or animated. Further, because the messages are stored in a relational database, users can make normal (eg relational) database type queries on the stored messages, e.g. "how many messages did Agent A send out regarding Job 21". The video replay facilities with message filters and the database query support significantly enhance the debugging effort of a user, by allowing him or her to focus-in or out and dynamically change perspectives while trying to make sense of the interactions between the agents.

In the graphical user interface shown in Figure 12, it is possible to see the layout of agents 1200 in the supply chain provisioning scenario described above. On the left of the window are layout and view controls 1210. Toolbar buttons 1220 on the right control video-style replay of messages while those on the left 1230 and a pop-up menu 1240 control the position and visibility of the agent icons.