

Referring to Figure 15, this tool allows a user to collate various statistics about a society of agents on a per agent basis as well as on a community basis. The statistics collected might include for instance, but are not limited to:

- 5 (a) the number of messages and their types sent by the agents over a time period;
 - (b) the number of messages sent by the agents in coordinating different jobs;
 - (c) the average loading of the agents, i.e. the proportion of time agents spend actually executing tasks; and
 - (d) the coordination versus execution time ratio, i.e. how much time is spent
- 10 coordinating tasks as opposed to actually running them.

Statistics such as these are particularly useful in debugging or fine-tuning the performance of a society of agents. For example, using the control monitor tool and the statistics tool, a user is better able to answer questions such as “what

15 organisational structuring, and distribution of task and coordination know-how best minimises the time spent coordinating jobs and maximises the time spent executing them (i.e. increasing the profitability of the society)”. If the agents in the society learn from experience, the statistics tool becomes even more useful in assessing the performance of different learning strategies since certain statistics

20 such as the average number of messages sent by the agent per job and/or the coordination versus execution time ratio can serve as performance metrics for measuring learning success.

The particular screen shown in Figure 15 shows the amount of traffic generated 1500 by the principal agents U, T, P, M, C in achieving the goal

25 MakeComputer. As expected from the task decomposition 700 shown in Figure 13, Agent C sends out three achieve-messages while Agent P only throws out one. The reply messages correspond to negotiation and post-negotiation (task management) dialogues.

The tool can support different display formats, such as histogram, pie,

30 line, or xy-scatter graph formats for the display of statistics. The choice of format is user-determinable, using toolbar buttons 1505, although there are pre-specified defaults formats for the various statistics.

Similarly to the society and report tools, the statistics tool supports database saving and video-style replay of agent statistics. For generality, only raw