The actual storage of messages in a database is performed by opening a link to a database proxy agent, and sending to it copies of the messages to be stored. Retrieval proceeds in a similar manner, albeit in reverse. This arrangement provides a flexible approach since any proprietary database system can be used

5   simply by interfacing it with a standard proxy which understand and communicates in the agent communication language.

5.2   The Reports Tool

10   In a collaborative multi-agent set-up, generally it is the behaviour of the society as a whole (i.e. the combined inputs of all the agents) which is important and not that of an individual agent. A typical problem in debugging multi-agent systems arises from the fact that each agent provides only a local view of the problem-solving effort of the society.

15   Each agent only knows about jobs and subjobs which have been allocated to and/or by it. No single agent holds data for the overall breakdown and the state of all the jobs.

        For example, in order to produce a computer, agent C might contract out part of this task to P to provide a laser printer. P in turn, might delegate part of its

20   contract to T to provide a toner cartridge. Because of the autonomy of the individual agents, C is only aware of the part of the task it is scheduled to perform, and the part it contracted out to P; it remains unaware of the part delegated by P to T. Thus, a user viewing any one of the agents in isolation gets an incomplete picture of the problem solving effort of the society. So, if for example C reports a

25   failure to perform the task, the user will be unable to immediately determine, for instance, that the root cause of the failure was because T failed to provide the toner cartridge as requested by P.

        The Reports Tool is able to request the relevant data from each of the agents, collate it and depict it. The Reports Tool applies the algorithm set out

30   below to collate the data and generate a full picture, which can then be represented in a GANTT chart of the type shown in Figure 7.

        Referring to Figure 8, for this tool, note that a job J given to an agent A may be split up into subjobs J1 and J2 which are allocated to agents B and C respectively. Subjob J2 may further be split into J21, J22, J23 and allocated to

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